1993

Making access meaningful: Effects of an early contact program on community college student success

Judy Bierlein McMillan
College of William & Mary - School of Education

Order Number 9326233

Making access meaningful: Effects of an early contact program on community college student success

McMillan, Judy Bierlein, Ed.D.

The College of William and Mary, 1993

U·M·I
300 N. Zeeb Rd.
Ann Arbor, MI 48106

MAKING ACCESS MEANINGFUL:
EFFECTS OF AN EARLY CONTACT PROGRAM ON COMMUNITY COLLEGE STUDENT SUCCESS

A Dissertation

Presented to

The Faculty of the School of Education

The College of William and Mary in Virginia

In Partial Fulfillment

Of the Requirements for the Degree

Doctor of Education

---

by

Judy Bierlein McMillan

April 1993

MAKING ACCESS MEANINGFUL:

EFFECTS OF AN EARLY CONTACT PROGRAM ON

COMMUNITY COLLEGE STUDENT SUCCESS

by

Judy Bierlein McMillan

Approved April 1993 by

Roger G. Baldwin, Ph.D.
Chair of Doctoral Committee

Thomas J. Ward, Ph.D.

James M. Yankovich, Ed.D

DEDICATION

With love and gratitude I dedicate this dissertation and degree to my daughter Jacqueline Gabrielle, my parents Gladys and Walter Bierlein, and to my husband Nick Koltun. May beauty surround you as your love and support have surrounded me and made this accomplishment possible.

TABLE OF CONTENTS

ACKNOWLEDGEMENTS

This research would not have been possible without the effort and support of many individuals. Robert G. Templin, President of Thomas Nelson Community College encouraged my professional growth, and is largely responsible for my focus on community college student success. Rennie L. Wolfe, Dean of Student Services, granted me the flexibility and support to balance the multiple priorities of the past three years. I am especially indebted to Christine Pedersen, chairman of the TNCC Advisory Committee on Enhancing Student Success, for her enthusiastic assistance in conducting the study, and for her invaluable efforts in securing college-wide acceptance of the intervention. Thanks also go to the entering students of Thomas Nelson Community College whose desire for achievement inspired me to search for a better college response to their needs.

On a personal level, two individuals were enormously helpful in providing feedback and encouragement. My fellow student, Tisa Mason, and my daughter Jacqueline, of The College of William and Mary, Class of '94, were scholarly, caring advocates. Without them, this enterprise would not have gone as smoothly.

Finally, and most importantly, I extend my sincere appreciation and gratitude to the members of my Doctoral Committee: James Yankovich, whose attention and respect for my work is a great source of pride; Thomas Ward, who made the dissertation enjoyable by teaching me how to perform the required statistical analyses with confidence, and particularly, Roger Baldwin whose generous encouragement and personal example have made my doctoral program one of the most valuable experiences of my life.

LIST OF TABLES

LIST OF TABLES

(continued)

TABLE

LIST OF FIGURES

MAKING ACCESS MEANINGFUL: EFFECTS OF AN EARLY CONTACT PROGRAM ON COMMUNITY COLLEGE STUDENT SUCCESS

ABSTRACT

The purpose of this study was to investigate the effects of an early contact program on the achievement, persistence, and satisfaction of new underprepared community college students. While open door admissions policies assure access to higher education, nearly three-fourths of all community college students leave before completing an associate degree. The traditional sink or swim approach to community college student success is at odds with the goal of improved student outcomes. It was hypothesized that first-time underprepared community college students who participate in a program providing personal contact and support exhibit greater achievement, persistence, and satisfaction than their cohorts who are left to seek their own assistance from the institution. Using a posttest-only control group design, 240 college entrants at an urban community college in eastern Virginia, were randomly selected and assigned to two groups. The treatment consisted of college-initiated telephone counseling, academic advising, and peer tutoring with students during

their first semester. Using the one-tailed t-test for independent samples and chi square test of association, it was found that at the end of 15 weeks, students (n = 108) who participated an the early contact program achieved significantly higher average GPA ($t = 3.7$, $p<.05$), number of productive grades ($t = 3.24$), and number of college credits ($t = 4.46$). Program participants were retained in college at an average rate of 17 percent higher than those who did not participate. However, administration of the ACT Student Opinion Survey to both groups near the end of the first semester, found no significant difference in their satisfaction with the college. It was concluded that the early contact program was more effective in promoting achievement and persistence than the usual passive treatment given entering students at Thomas Nelson Community College.

JUDY BIERLEIN MCMILLAN

SCHOOL OF EDUCATION

THE COLLEGE OF WILLIAM AND MARY IN VIRGINIA

DR. ROGER G. BALDWIN, DOCTORAL COMMITTEE CHAIR

MAKING ACCESS MEANINGFUL:

EFFECTS OF AN EARLY CONTACT PROGRAM ON

COMMUNITY COLLEGE STUDENT SUCCESS

CHAPTER 1

INTRODUCTION TO THE PROBLEM

The most critical deficiency now facing America's community colleges is the lack of a systematic approach for increasing the success rates of its students (Alfred & Kreider, 1991). Open door admissions policies assure access to higher education, but 73 percent of community college students leave before completing an associate degree (Tinto, 1987).

Many reasons are given for the high attrition rate since dropping out, like enrolling, results from complex motivations and conditions (Adelman, 1992; Olivas, 1979). Community college students are generally of lower academic ability as compared to traditional students in selective colleges and universities (Brint & Karabel, 1989; Cross, 1971). Invariably, those of poor ability are least likely achieve passing grades and to graduate (Tinto, 1987).

Like all commuting students, two-year college students spend less time on campus, have less academic and social interaction with faculty, staff, and other students outside of class, and are more likely to experience a wide range of competing external influences as compared to residential

students (Bean & Metzner, 1985; Christie & Dinham, 1991; Jacoby, 1989).

Community colleges enroll nearly half of all public-college students, and the percentage is predicted to increase as a result of the recent recession's impact on tuition costs (Jacobson, 1991). While 33 percent of community college entrants earn an associate degree, only 13 percent eventually get a bachelor's degree. This compares negatively to the graduation rates of four-year college entrants of whom 61 percent earn a bachelor's degree (Tinto, 1987).[1]

Students at two-year colleges are substantially less likely than their peers at four-year colleges to complete a bachelor's degree program and to reap the associated benefits (Crook & Lavin, 1989; Richardson & Bender, 1987). The revolving door of attrition wastes human potential as thousands of individuals are at risk of not receiving the higher education to which they might otherwise be entitled (Pascarella & Terenzini, 1991).

While not all attrition is a negative reflection on a college's ability to meet student needs, measures of student persistence, particularly in comparison to national trends, can be important indicators of an institution's effectiveness. Attrition in community colleges should be

---

[1]The national transfer rate of community college students to four-year colleges or universities is 23.7 percent (Jones, 1992.)

reviewed in terms of the goals of the students. However, unnecessary attrition, the type that can be predicted and prevented by the institution, should become the target of all retention activities. Accepting that focus requires a recognition that institutional deficiencies contribute to attrition as much as student deficiencies (Zwerling, 1980).

The traditional sink or swim approach to community college student success is at odds with the mandate to improve student outcomes (Astin, 1985a; Alfred & Linder, 1990). For access to be meaningful, institutional action to improve the rates of community college student success with respect to achievement, persistence, and satisfaction is urgently needed (National Institute of Education, 1984; Richardson, 1988; Schlossberg, Lynch, & Chickering, 1989).

From a purely economic perspective, attrition is costly to students and institutions alike. Dissatisfied students leave college, taking others with them and telling prospective students not attend that college. The long-term negative influences of dissatisfied students work to counteract positive college public relations and recruitment activities. Enrollment management research indicates that it is far less expensive to retain a current student than it is to recruit a new student (Hossler, 1984).

Last year, the National Council of Instructional Administrators, an affiliate of the American Association of Community and Junior Colleges, developed a policy on student

success to help community college faculty and administrators work together to retain students. Their policy calls for early contact with students, and faculty involvement with all facets of student activity (Council for the Advancement and Support of Education, 1991). Research studies at both two-year and four-year colleges strongly support the notion that early and continuing contact with high-risk students has a positive impact on student achievement and retention (Dunphy, Miller, Woodruff, & Nelson, 1987; Noel, Levitz, & Kaufmann, 1982; Pascarella, Smart, & Ethington, 1986; Terenzini, Lorang, & Pascarella, 1981).

Purpose of the Study

Community college students' lack of interpersonal academic and social contact with individuals on campus puts them at a disadvantage (Pascarella & Terenzini, 1991; Tinto, 1987). Astin (1985a) suggests that this is particularly a problem for underprepared students who are making the transition to college. As a result, their tenure and attainment at the college are at risk.

The purpose of this study was to investigate the effects of an early contact program on the achievement, persistence, and satisfaction of new underprepared community college students. The study was a form of applied research aimed at improving current practices.

Terms

Operational definitions of the study's key terms and concepts are as follows:

1. **Early contact program**

A series of college-initiated personal contacts with students during their first semester, designed to foster interaction between students and faculty, staff, and other students with the following objectives:

a. To personalize the academic environment for new students;

b. To help students identify positively with the college by conveying concern for them;

c. To encourage student involvement with the academic and social domains of the college.

2. **Underprepared students**

College entrants who are less than fully prepared for college-level work as indicated by their tested academic skills; those individuals who score at or below the cut-off point on one or more of three areas of basic skills in which they are tested. For the purpose of this study the instruments and raw cut-off scores are as follows:[2]

a. CGP Written English Expression Test.....24

---

[2]The instruments and their respective cut-off scores were determined by the faculty of the English department and the math department at the community college serving as the site of the study. Cut-off scores, as well as course placement guidelines, are officially issued by the chief academic officer of the institution.

b. Degrees of Reading Power Test.....57

c. Descriptive Tests of Mathematics Skills.....21

3. **Student success**

Defined in terms of the student outcome measures of academic achievement, satisfaction, and persistence.

4. **Academic achievement**

Grade point average, number of productive grades[3], and number of college credits earned during the first semester at the college.

5. **Satisfaction**

An attitude which reports the degree to which an experience is perceived to be either rewarding or discomforting. Satisfaction occurs when expectations are met or exceeded as measured by items on the American College Testing Student Opinion Survey.

6. **Student persistence**

For the purpose of this study, persistence is the number of students remaining at the college at the end of the semester, and the number of students who re-enroll for the following semester.

---

[3]Productive grades include grades of A, B, C, P (pass), and S (satisfactory). The grade of S carries no grade point credit and is used only for remedial course work. Unproductive grades include grades of D, F, W, I (incomplete), U (unsatisfactory), and R (re-enroll).

CHAPTER 2

REVIEW OF RESEARCH AND LITERATURE

The review of literature and previous research presented in this chapter encompasses the following areas: the theoretical basis for the study, review of the literature on access and the community college, related research on academic achievement and persistence, and a discussion on institutional response to attrition.

Theoretical Framework

Since the proposed study concerns the effects of institutional action on student behavior, the theoretical basis for the study centers around college impact models of student change. These impact models have a primary base in the theories of sociology and organizational psychology.

The following models address the theoretical significance of the proposed study:

1. Astin's Theory of Involvement
2. Tinto's Model of Institutional Departure
3. Pascarella's Model for Assessing Effects of College Environments on Student Learning
4. Weidman's Model of Undergraduate Socialization

College impact models have several propositions in common. They assign a prominent role to the context in which the student learns. Students are seen as active participants in the learning process, but the environment is also seen as an active force that not only affords opportunities for growth encounters but also requires a student to respond. Each of these models also places emphasis on the frequency and content of students' interactions with the major socializing agents on campus--faculty, staff, and other students.

Astin (1985a) has proposed a theory of involvement to explain the dynamics of how students develop. Simply stated, students learn by becoming involved (Astin, 1985b). Involvement theory assigns the institutional environment a critical role in that it affords students a great number and variety of opportunities for encounters with other ideas and people.

Tinto's Model of Institutional Departure (the first model in Appendix A) is similar to Astin's theory, however it serves as a more explicit explanation for the college student attrition process (Tinto, 1975, 1987). Tinto's (1975) model has been the focus of considerable research over the past decade (e.g. Aitken, 1982; Christie & Dinham, 1991; Pascarella & Terenzini, 1980; Stage, 1989). Tinto theorizes that students enter college with intentions and commitments which are subsequently modified through a series

of interactions between the student and the organizational structures and members of the academic and social systems of the institution. Satisfying encounters with the formal and informal academic and social systems of the institution lead to greater integration in those systems and thus to student retention (Tinto, 1987).

Pascarella (1985) has suggested a causal model for assessing the effects of differential college environments on student learning and cognitive development (see the second model in Appendix A). Student change is seen as a function of students' background characteristics, interactions with major socializing agents, and the quality of students' efforts in learning and developing. This model affords the opportunity for multi-institutional studies of collegiate impact (Pascarella & Terenzini, 1991).

Most recently, Weidman (1989) has proposed a model of undergraduate socialization that is primarily based on the sociological literature on adult socialization (see the third model in Appendix A). In addition to institutional socializing forces, Weidman's model to a greater extent than that of Astin, Tinto, or Pascarella, also hypothesizes important noncollege influences on students. The model suggests a continuing socializing role for parents and other noncollege reference groups, such as peers, employers, and community organizations (Weidman, 1989). Because of its

recent introduction into the literature, this model's utility and validity remain unexamined.

Finally, a theory from social psychology--mattering and marginality--is cited for its relevance to the study. This theory advanced by Schlossberg (1989), builds on the models by Astin, Tinto, Pascarella, and Weidman in that it posits an affective outcome for successful interactions between students and major socializing agents of the college.

Mattering refers to the belief people have, whether right or wrong, that they matter to someone else, that they are the object of someone else's attention, and that others care about them and appreciate them (Schlossberg, Lynch, & Chickering, 1989). Marginality, on the other hand, is the feeling of being at the border or margin as opposed to feeling central and involved. According to the theory, students need to feel as if they matter in order to achieve and persist in higher education (Schlossberg, 1989).

The notion of mattering is based on the work of Rosenberg and McCullough (1981). In dealing with adolescents, the researchers found that even within high-risk environments, adolescents were less likely to participate in delinquent activities if they felt as if they mattered to someone (Rosenberg & McCullough, 1981). The theory of mattering and marginality presumes the importance of caring interactions with students. (Jacoby, 1989; Kuh, Schuh, Whitt, & Associates, 1991).

Access and the Community College

Recent years have seen a great widening of access to higher education. A larger proportion of the United States population than ever before, and a larger proportion than in any other nation enjoys the advantages of education beyond high school (Fund for the Improvement of Postsecondary Education, 1992). Opportunity and educational access are concepts commonly associated with the community college movement. Indeed, these institutions are referred to by some as the "Ellis Island of higher education" (Vaughan, 1983).

Perhaps the most important concept to influence the development of the community college is the belief that all Americans should have access to higher education. The traditional barriers to access are economic limitations and discrimination. As the nation committed itself to the belief that education beyond high school is a right and not just a privilege, community colleges flourished.

While open access education first gained popular support in the period following World War II, its origins in this country can be traced to earlier times when Thomas Jefferson and Andrew Jackson proposed "education for all" (Rudolph, 1965). But it was not until 1862, with the Morrill Land Grant Act that greater access to higher education was achieved (Roueche & Baker, 1987).

The first public community college was founded by William Rainey Harper in 1901 in Joliet, Illinois (Monroe, 1972). In 1947, the concept of open access was further advanced by the Truman Commission on Higher Education. The Commission's report called for the establishment of tuition-free community colleges. The 1960's saw a dramatic increase in the number of traditional-age college students as the baby boom generation came of age. Veterans of the Korean War and the Vietnam conflict, sponsored by the GI Bill, were another source of new students. In the United States, open access to higher education was realized during the 1960s; the boom period in community college growth. Enrollment in higher education rose from approximately 3.5 million in 1960 to 8 million in 1970 (Pusey, 1978).

The outcome has been the entry into higher education of a new class of students whose backgrounds are socially, economically, racially, and educationally diverse. As vehicles for the democratic ideal of open access education envisioned by the Truman Commission in 1947, community colleges have successfully reduced the barriers to higher education represented by economic status, geographic location, gender, and race for millions of Americans (Pusey, 1978; Roueche & Baker, 1987). Today, community colleges

enroll nearly half of the nation's undergraduates;[4] 54 percent of all first-time entering freshmen (Rice, 1989).

However, access--the ability to enter college--is only the intended beginning. For community colleges to fulfill their promise, student achievement and persistence are also required (Eaton, 1989; National Institute of Education (NIE), 1984). As Zwerling in Second Best (1976) points out, "The critical question is what happens to individuals once they have gained admission."

Some critics contend that America's community colleges have placed too much emphasis on access and too little emphasis on student achievement (Brint & Karabel, 1989; Cohen & Brawer, 1988). Community colleges, critics argue, are better at providing access than they are at offering evidence of student achievement (Richardson & Bender, 1987). Even individuals who are academically underprepared for college-level work are admitted; but their tenure at the college is in question (Dougherty, 1987).

The recent literature on community colleges, however, suggests that the emphasis has shifted from measuring access in terms of college admission to a concern with equality of opportunity measured by accomplishment, or the extent to which students achieve defined educational objectives

---

[4]In 1992, the nation's 972 public two-year institutions enrolled 4,937,663 students, representing 45.9% of all public-college students. During the same year, 595 public four-year institutions enrolled 5,802,877 students (Chronicle of Higher Education Almanac, 1992).

(Parnell, 1990; Richardson, 1988). The focal point of research in community colleges in recent years has centered around two major issues: student success within the community college and transfer success (Carter, 1991).

The shift to a more comprehensive definition of access appears appropriate given the key issues facing American higher education. A 1988-89 Survey of Higher Education conducted by the Center for Policy Studies in Education found that in the opinion of 148 state governors and college presidents who responded to the survey, three of the top five issues facing higher education are assessment and accountability, minority participation, and maintaining America's competitive edge (Gilley, 1991). The issues reflect today's environment in which institutional budgets are declining, student populations are becoming more diverse, and dramatic shifts are occurring in the labor market.

Minority Participation

Community colleges enroll 55 percent of all Hispanic undergraduates and 43 percent of all black students who go to college (Commission on the Future of Community Colleges, 1988).[5] Within community colleges, minorities are

---

[5]According to the 1992 Chronicle of Higher Education Almanac, there are 1,223,303 black students and 758,054 Hispanic students enrolled in colleges and universities nationwide. Minority students comprise 17.3 percent of enrollment at public four-year institutions and they comprise 22.5 percent of enrollment at public two-year institutions (p. 3).

concentrated in the urban community college where 50 to 70 percent of the high school students are minority (Richardson & Bender, 1987). For urban minority students, the community college is their primary or sole access to higher education (Urban Community Colleges Commission, 1988). For minority group members in general, the two-year college is the most likely point of entry into the postsecondary educational system (Pascarella & Terenzini, 1991).

Minority student achievement in the community college represents an urgent priority (Commission on the Future of Community Colleges, 1988). Attrition rates of black and Hispanic community college students remain high and degree attainment and transfer rates to baccalaureate degree-granting institutions are low (Pascarella & Terenzini, 1991). Yet, research dealing with minority students is notably scarce (Urban Community Colleges Commission, 1988).

One study of black students in an urban community college was conducted by Lois Weis (1985). The methodology was a case study with participant observation characterized by a year of intense social interaction between the researcher and the subjects. Weis conducted interviews with faculty and students and attended classes in the community college during the academic year 1979-80. Weis concludes that black students in an urban community college are caught between two worlds; a situation that ensures that most of them will return to the ghetto streets. One major

limitation of this study is the potential loss of objectivity by the researcher due to the nature of the design.

Tinto (1987) notes that minority students have a hard time finding a supportive community in academia--a situation often leading to departure from college. Many black students are overwhelmed by the perceived academic competition and feel unprepared for college (Fleming, 1981).

Between 1990 and 1995, the growth rate for minorities in the general population is expected to be five times the rate for whites (Hodgkinson, 1989). However, when the open door becomes a revolving door, college access is an empty promise for minority students (Brint & Karabel, 1989; Richardson & Bender, 1987; Samuels, 1985; Smith, 1989).

Changes in the Economy

These shifts in population are occurring at the same time that the economy is undergoing dramatic changes. Manufacturing is becoming less important and the technology and service industries more important as sources of new jobs (Johnston, & Packer, 1987). In addition, the new jobs being created in all segments of the economy will require higher levels of skill in mathematics, language, and reading than are required today (Commission on the Skills of the American Workforce, 1990).

New education and training programs are required to train an increasingly diverse population of unemployed and

underemployed individuals to perform in occupations in which shortages are growing. Community colleges are expected to address deficiencies in the areas of worker training and retraining, technology transfer, technician education, and community service (Governor's Advisory Committee Workforce Virginia 2000, 1991; Parnell, 1990). Student access and success are essential if community colleges are to play an effective role in fostering economic development.

Assessment and Accountability

External forces are bringing about change within higher education (Evangelauf, 1990; Jacobson, 1991). Colleges are being asked to respond to a broad range of questions concerning student success from state agencies, state boards, and accrediting associations (Carter, 1991). Research in community colleges reflects the recent emphasis on accountability. Like other institutions of higher learning, community colleges are subject to evaluation on student outcome measures such as retention and graduation rates (Alfred & Kreider, 1991; DeLoughry, 1990). How well students do is a test of a college's performance against its mission and purpose (Seybert, 1990). Student success is considered the most significant measure of institutional quality and effectiveness (Astin, 1985a; Mayhew, Ford, & Hubbard, 1990; Tinto, 1987).

Community College Student Departure

Community colleges face a difficult challenge with respect to improving student retention. The national drop-out rate for two-year public institutions is 47.9 percent between the freshman and sophomore year; as compared with 31.9 percent for four-year public institutions; and 27.4 percent for four-year private institutions (American College Testing Institutional Data File, 1992).

More than half of all the students entering community colleges today read below the eighth grade level (Roueche & Roueche, 1982). At Miami-Dade Community College, 70 percent of the incoming students are identified as underprepared for academic work based on their scores on one or more of the three areas in which they are tested (Watkins, 1991).

Academically underprepared students feel vulnerable, and are at higher risk of leaving college due to academic difficulties than students who enter with the basic skills to master college-level work (Astin, 1985a; Upcraft & Gardner, 1989). Furthermore, academic transition to college is more difficult for first-generation college and disadvantaged students than advantaged students of similar ability. The former students need more support to be successful (Tinto, 1987). Research has found that there is a strong positive correlation between academic success and persistence in college (Aitken, 1982; Bean, 1983; Forrest, 1982).

Academic Achievement and Persistence

A student's grades are probably the single most revealing indicator of his or her successful adjustment to the academic demands of a college's course of study. Without satisfactory grades, a student will not graduate from college, nor will she or he be admitted for transfer to a senior institution (Astin, 1975). Although grades are largely a combination of individual academic ability and other personal traits, such as motivation and perseverance, they are not beyond the influence of institutional interventions (Pascarella & Terenzini, 1991).

Kulik, Kulik, and Shwalb (1983), conducted a meta-analysis of 60 published and unpublished studies evaluating the experimental effectiveness of special college programs designed to facilitate the academic adjustment of underprepared students. The effects of four types of programs were reviewed: instruction in academic skills, advising and counseling programs, comprehensive support services, and remedial or developmental studies. Kulik, Kulik, and Shwalb (1983) report a statistically significant overall effect size in grades favoring the college interventions. On the average, those exposed to the interventions had a grade point average .27 of a standard deviation higher than similar students in the control groups (an advantage of 10.6 percentile points). The overall effect was greatest during the freshman year with remedial

or developmental programs being significantly less effective than the other interventions. In addition, program effects were slight in community colleges, somewhat greater in 4-year colleges, and greatest in doctoral universities.

Kulik, Kulik, and Shwalb (1983) also estimated the effect of these programs on college persistence rates and found that on average those exposed to the various interventions had a statistically significant eight percent advantage in persistence rate over similar students not exposed to the interventions. As with grades, the effect was stronger during the freshman year than thereafter (Kulik, Kulik, & Shwalb, 1983).

More recent research not included in the Kulik, Kulik, and Shwalb (1983) synthesis is consistent with their conclusions concerning effects of academic adjustment interventions on both grades and persistence (for example, Abrams & Jernigan, 1984; Earl, 1987; Glennen & Baxley, 1985; Kirschenbaum & Perri, 1982; Simpson, 1988; Walsh, 1985).

The Critical Freshman Year

Retention research and national trends present strong evidence that students' experiences during their first year of college largely determine their academic success in subsequent years. Affirming such evidence, the Carnegie Foundation for the Advancement of Teaching (Boyer, 1987) notes that a good college takes steps to make the freshmen year special.

The significance of the freshman year for a successful college experience is underscored in another prominent report. The Study Group on the Conditions of Excellence in American Higher Education in Involvement in Learning: Realizing the Potential of American Higher Education (NIE, 1984), advocate as their first recommendation the "front loading" of resources for first year students in order to increase student learning and encourage persistence. The report states, "At the present time, first year students are ill-served by many of our institutions of higher education. They are often treated impersonally, and given lower priority in academic advising" (p. 26).

At the same time, retention research consistently shows that the highest amount of attrition occurs during the freshman year (Beal & Noel, 1980). Of the roughly 2.6 million students entering degree programs in higher education each year, over a million do not receive a degree, and over half of the attrition occurs in the first semester. (Fund for the Improvement of Postsecondary Education, 1992). Noel and associates (1985) note that most students who leave an institution during the first year make the decision to do so early in their first semester. Clearly, the freshman year offers the greatest opportunity for controlling attrition (Kulik, Kulik, & Shwalb, 1983; Upcraft & Gardner, 1989).

Student Persistence

Student persistence behavior in higher education has become an issue of considerable scholarly interest (e.g. Astin, 1975; Cope & Hannah, 1975; Tinto, 1975, 1987, 1988). Literally hundreds of studies have been conducted. The literature is limited, however, in that nearly all of the research has been conducted on traditional-age college students attending four-year institutions, most of them residential. There is insufficient evidence to conclude that the factors that influence persistence for this group are the same as they are for nontraditional commuter students (Bean & Metzner, 1985).

An interesting set of contradictory findings in persistence research is that on the issue of the importance of community college student social contact with individuals on campus. Bean and Metzner (1985) reviewed 23 research studies of community college student persistence as part of their extensive conceptual model of nontraditional undergraduate student attrition. They argue that community college students are more affected by their external environment than by social integration as it affects traditional student attrition (Bean & Metzner, 1985). Five additional studies, not included in the Bean & Metzner (1985) analysis, but cited by Spanard (1990) in her review of research on adult reentry, retention, and eventual

completion of a college degree, generally arrive at the same conclusion.

Another study by Voorhees (1987) followed re-enrollment patterns of 369 students in a community college over two semesters. In this study, academic integration, as represented by a logit model of persistence, grade-point average, number of informal conversations with faculty, and number of hours spent studying, was determined not to have an independent effect on persistence. This study included both new and continuing, as well as full- and part-time students in the sample.

On the other side, Tinto (1987, 1988) argues that there are reasons to suspect that social and intellectual contact beyond the classroom may be as important, if not more important, to persistence in community colleges. It is interesting that Pascarella, Smart, and Ethington (1986), arrive at the same conclusion in their longitudinal study of community college persistence. Eight hundred and twenty-five students who initially enrolled in 85 different two-year colleges were tracked over a nine-year period. Contrary to earlier research on commuter students which did not support the importance of social contact (e.g. Pascarella, Duby, & Iverson, 1983), the 1986 researchers found the opposite to be true. In this instance, however, Pascarella, Smart, and Ethington (1986) followed students

over a nine-year period rather than the two-year period typical of earlier studies.

Using multiple regression to test for significant relationships among 16 independent variables on community college persistence, the researchers found that the variables with significant, positive direct effects on degree persistence for both men and women were academic integration and social integration. Pascarella, Smart, and Ethington (1986) conclude:

> The relative importance of academic and social integration in predicting persistence suggests that what happens to a student after he or she enrolls at an institution may be as important to ultimate persistence as the influence of precollege variables. Thus it may be possible to enhance student persistence through purposeful institutional policies and practices designed to enhance student social and academic integration....The present study thus provides additional evidence that the personal relationships that students develop with faculty and staff are a potentially significant factor in their persistence behavior (pp 67-68).

Another revealing piece of research is an ethnographic study by Neumann (1985) of student persistence at a northeastern urban community college. Neumann selected for study a group of students who were underprepared and at risk

of not completing their degree programs. Contrary to the conclusions of past quantitative studies of departure in nonresidential institutions, he found that social contact with others at the college, especially members of the college staff, was a consistently expressed theme in the student's accounts of their own success (Neumann, 1985).

Institutional Action and Response

In 1971, Axtell offered the following: "The neglect of students has been so pervasive in educational history that it now enjoys the status of a veritable 'historical tradition'" (p. 14). While most institutions make social and academic support services available to students, there is room for improvement as evidenced by high attrition rates (Boyer, 1987, 1990).

Vincent Tinto (1987) in his book Leaving College: Rethinking the Causes and Cures of Student Attrition, offers principles by which successful retention programs should be governed. These principles are:

1. Institutions should ensure that new students enter with or have the opportunity to acquire the skills needed for academic success;
2. Institutions should reach out to make personal contact with students beyond the formal domains of academic life;

3. Institutional retention actions should be systematic in character;
4. Institutions should start as early as possible to retain students;
5. The primary commitment of institutions should be to their students;
6. Education, not retention, should be the goal of institutional retention programs (pp. 138-140).

Tinto (1987) identifies institutional actions that have proven effective in treating the "early roots of student withdrawal" (p. 149). According to Tinto (1987), early contact programs, designed to provide new students with personal contact with other members of the institution, satisfy the goal of incorporating individuals into the academic and social domains of the college. The value of personal contact is recognized by scholars, as well as the general public (Commission on the University of the 21st Century, 1990; Friendly, 1985).

The following anecdote by Schlossberg and associates (1989) further demonstrates the impact of personal contact:

> A faculty member was forced to cancel a class lecture because of the flu. The class was large, with students from many departments and neighboring colleges. The faculty person, with the help of a secretary, called every student in the class. The following week, students remarked that never in their experience as

> students had a faculty member had the consideration to call them; in fact, they had never received a phone call from either a faculty member or an administrator. They were amazed, touched, and grateful (p. 21).

While in-person contacts are preferred, using the telephone to check in and talk with new students can also provide valuable interaction (NIE, 1984; Noel, Levitz, Saluri, & Associates, 1985). Tinto (1987) recommends that nonresidential colleges encourage both faculty and staff to call each of their students at least once during the course of a semester (p. 167).

Studies show that freshmen who can name a campus-affiliated person they can turn to with a problem are more than twice as likely to return for the sophomore year as those who cannot (Levitz & Noel, 1989). Yet, 40 percent of the undergraduate respondents to the Carnegie Foundation's survey (Carnegie Foundation for the Advancement of Teaching, 1986) said no professors at their institution took a special personal interest in their academic progress. Only 34 percent knew professors they could turn to for personal advice. Studies have also shown that half of the students attending community colleges and four-year institutions had not met with a faculty member outside of class, and many have had only minimal individual contacts with their instructors (Pace, 1989; Baird, 1990).

Frequent interaction with faculty members is more strongly related to satisfaction with college than any other type of involvement or any other student or institutional characteristic (Astin, 1985a). Research evidence is clear that the more frequent and rewarding interactions are between students and other members of the institution, the more likely students are to persist (Endo & Harpel, 1982; Jones & Watson, 1990; Pascarella, Smart, & Ethington, 1986).

Early Contact Programs

The purpose of an early contact program is to link new students with individuals who are already invested in the institution, and to introduce them to available support services. The underlying assumption is that effective institutions do not leave student success to chance (Ferguson, 1990; Magallan, 1988). Instead, these colleges take proactive roles in ensuring student success by serving as participants in the student's intellectual and personal growth (Scott, 1987; Stodt & Klepper, 1987). Rather than employing a sink or swim philosophy toward new students, a college that adopts an early contact program assumes that students will respond to direct contact in which information and assistance is offered (Astin, 1985b; Tinto, 1987). In support of that assumption, a retention study by Beal and Noel (1980) found that a caring attitude of faculty and staff is the most effective retention force on campus.

Summary

College impact models of student change stress the importance of both the student as participant, and the learning environment as context for growth opportunities. Student involvement theorists, such as Astin (1985a), Tinto (1987), and Pascarella (1985) emphasize the quality and frequency of student interactions with major socializing agents on campus. Schlossberg (1989) suggests that such interactions are satisfying when students feel as if they matter to someone at the institution.

An attempt to evaluate the definition of access with respect to community colleges reveals a gradual shift from a narrow definition of the ability to enter college to a more comprehensive definition which goes beyond admission and incorporates student achievement, persistence, and satisfaction. Community colleges are positioned to play a key role in addressing the issues facing higher education and the nation. To do that effectively, community colleges must take action to help students reduce barriers to their academic success.

Since over half of the attrition occurs during the first semester, interventions during the first semester for those at risk of dropping out are the most likely to yield positive results. Early contact programs which actively promote student interaction with faculty, staff, and

students at the institution are felt by some to be an effective means of increasing student success.

The research literature shows that college programs for underprepared students do have positive effects on achievement and persistence. The effect size for community college students, however, is smaller than for students in other institutions. The evidence is mixed on the issue of social contact as a factor in community college student persistence. More research is needed on how college programs affect community college students (Pascarella & Terenzini, 1991).

Regarding other recommendations for future research, Cope and Hannah (1975) state that attrition should be studied on an institutional level since institutional characteristics have large effects on persistence. Tinto (1988) points to the need for persistence research that focuses on the critical transitions occurring during the first semester of college. The NIE study group (1984), in their recommendations to the research community, call for more action-oriented research that will yield better analyses and more information about implementation. They conclude, "We already know a great deal about what needs to be done, but we seem to lack the ability to implement effectively" (p. 73).

Research Questions and Hypothesis

The research evidence indicates that early contact with new students for the purpose of fostering interaction and involvement has a positive impact on their achievement, persistence, and satisfaction. Underprepared students in particular can benefit from early intervention which offers support and assistance. As Tinto (1987) suggests, community college students are generally at a disadvantage since they lack the time and therefore the contact with others on campus. Schlossberg (1989) reports that a student who feels as though he or she matters to someone at the institution is more likely to remain.

Research Questions

In light of these considerations, answers to the following questions were sought:

1. Do students who participate in an early contact program achieve higher first-semester grade point averages than students who do not participate in an early contact program?
2. Do students who participate in an early contact program achieve a higher number of productive grades in their first semester than students who do not participate?
3. Do students who participate in an early contact program achieve a higher number of college credits in their first semester than students who do not participate?

4. Are students who participate in an early contact program more likely to complete their first semester at the college than students who do not participate?
5. Are students who participate in an early contact program more likely to enroll for the following semester at the college than students who do not participate?
6. Do students who participate in an early contact program express a higher level of satisfaction with the college's programs and services than students who do not participate?
7. Do students who participate in an early contact program express a higher level of satisfaction with the college's concern for them as individuals than students who do not participate?

Hypothesis

It was hypothesized that new underprepared community college students who participate in a program which provides early contact and support exhibit greater academic achievement, persistence, and satisfaction than new underprepared community college students who are left to seek their own support and assistance from the institution.

CHAPTER 3

METHODOLOGY

To investigate the effects of an early contact program on the success of new underprepared community college students, the current research undertook an experiment employing a posttest-only control group design. The duration of the study was one semester lasting 15 weeks. After the semester ended, statistical analyses of comparative student outcome data on achievement, persistence, and satisfaction were performed to test the hypothesis under investigation.

Subjects

The sample was selected from a population of approximately 1,400 first-time college entrants for fall semester 1992 at an urban community college in eastern Virginia.

External Context

There are four urban community colleges in eastern Virginia---J. Sargeant Reynolds Community College, Tidewater Community College, Northern Virginia Community College, and Thomas Nelson Community College. These four are the largest

of the 23 public two-year institutions which comprise the Virginia Community College System (VCCS). Together, the urban community colleges in eastern Virginia account for 55 percent of the State's total community college enrollment.

Virginia's community colleges are institutions with broad missions which address the needs of very diverse populations. Programs are offered in occupational and technical fields, the liberal arts and sciences, general education, continuing adult education, pre-college and pre-technical preparatory programs, and industrial training programs. Virginia community colleges offer approximately 220 different programs in which a student may receive either an Associate in Applied Science degree, an Associate in Arts and Science degree, an Associate in Arts degree, an Associate in Science degree, a certificate or a diploma. Developmental studies are offered to those students who need remedial work to prepare for college-level courses. In Fall 1991, 20,315 VCCS students took one or more developmental courses (Graham, 1992). This represents 13.8 percent of the total VCCS student enrollment.

Approximately 147,000 students were enrolled in Virginia community colleges in fall 1991 (Harris, 1991). The four urban community colleges in eastern Virginia enrolled approximately 80,750 of these students (Harris, 1991). According to a report published by the VCCS (Puyear, 1989), there is a clear tendency for the larger VCCS

colleges to have lower student retention rates. Vice Chancellor Puyear attributes this tendency to:

> the likelihood that a student in a large college may become lost in the mass and feel that he or she is merely a number or a nameless face in the crowd. If the student feels this way, he or she will likely have more difficulty establishing a personal relationship with an individual faculty or staff member, and such a relationship is instrumental to the student's success (p. 14).

The Study Setting

Thomas Nelson Community College (TNCC)[6] was selected as the site of the study because it ranks low on some measures of student success. For example, only about one-third of first-time students complete as many as 12 credits at the college; fewer than one-fourth of the black students reach that level (Strategic Planning Task Force, 1990).

According to a recent VCCS study (Puyear, 1989), TNCC has the lowest student retention rate in the system--79 percent for full-time degree-seeking students from fall to spring term. On the measure of productive grades earned by full-time degree-seeking students, the college ranked last

---

[6]The college is named in honor of Thomas Nelson, Jr. of Yorktown, who was a signer of the Declaration of Independence and an early colonial governor of the Commonwealth.

in the VCCS (Puyear, 1989). See Table 1 for 1988-89 to 1991-92 TNCC retention indicators.

Other measures of the college's effectiveness are negatively impacted by its low retention rates. For example, at TNCC, 12 percent of entering students complete an Associate degree within five years. The national average degree completion rate for community college students is 27 percent (Tinto, 1987). In addition, the TNCC student transfer rate of 17 percent compares negatively to the national transfer rate of community college students to four-year colleges and universities of 23.7 percent (Jones, 1992). In 1990, TNCC received a federal grant to develop systems to help students improve their success rates.

Table 1

TNCC Retention Indicators 1988-89 to 1991-92

	1988-89	1989-90	1990-91	1991-92
% Returning Fall to Spring	78.8	77.3	75.5	77.5
% Productive Grades (Fall)	66.8	68.1	67.9	69.1

Source: TNCC Institutional Research Files

Thomas Nelson Community College is the largest single campus institution in the VCCS, enrolling approximately

4,000 full-time equivalent students (FTES). In 1991-92, a total of 11,545 students enrolled in credit courses; 4,054 attended non-credit courses at TNCC. Credit enrollment has increased by 20 percent over the past five years. The TNCC mission statement is in Appendix B.

With the exception of the proportion of black students enrolled at the college, TNCC student characteristics are very similar to those of the general population of community college students in the VCCS and in the United States as shown in Table 2.

Table 2

Community College Student Profile Fall 1991:

National, State, and Local Comparisons[a]

Characteristics	USA	VCCS	TNCC	Sample[b]
Male	42	42	42	39
Female	58	58	58	61
White	77	80	71	59
Black	10	13	23	36
Other	13	7	6	5
First-Time	--	20	20	100
Transfer	--	10	9	0
Returning	--	70	71	0
Part-Time	67	73	75	25
Full-Time	33	27	25	75
Median Age	25	26	27	19

[a]expressed in percentages
[b]n = 216
Source: VCCS 1991 Enrollment Book

A look at changing TNCC student enrollment patterns over the past five years as shown in Table 3 indicates a trend toward more full-time, day, college transfer students.

Table 3

1988 to 1992 TNCC Credit Student Enrollment Characteristics[a]

Student Type	1988	1989	1990	1991	1992	Sample[b]
Full-Time	23.0	22.8	21.7	25.0	26.9	75
Part-Time	77.0	77.2	78.3	75.0	73.1	25
Day	63.8	65.6	69.5	72.6	74.5	91
Evening	36.2	34.4	30.5	27.4	25.5	9
Technical	42.3	39.4	38.2	40.3	39.9	44
Col. Transfer	29.2	33.8	34.4	38.7	42.1	56
Non-Curricular	28.5	26.8	27.4	21.0	18.0	0

[a]expressed in percentages
[b]n = 216
Source: TNCC Institutional Research Files

Sample

The subjects for the study were 240 Thomas Nelson Community College students who were new for fall semester 1992 and were:

1. First-time entering students. Transfer students were excluded from consideration since the effects of their previous college experiences could result in unwanted differences if they were selected as subjects for the study.

2. Enrolled in nine or more credit hours. Nine semester hours is the average number of credits taken per semester by students at the college. In addition, since retention studies are typically done on full-time, degree-seeking students, more comparisons could be drawn between the subject study and previous research on college students.

3. Academically underprepared. Only college entrants who had taken the battery of placement tests and who had scored at or below the cut-off point on one or more of three areas of basic skills were selected for the study. For the purpose of sample selection, the instruments and raw cut-off scores as determined by the faculty of the English department and the math department of the college are as follows:

a. CGP Written English Expression Test.....24

b. Degrees of Reading Power Test.....57

c. Descriptive Tests of Mathematics Skills.....21

First-time, underprepared students were targeted for investigation because they are considered to be "at risk" of failing to complete their educational objectives. Demographically, they are more likely than the general population of community college students to be minority, low socioeconomic status, and first-generation college students. Previous experience with first-time underprepared students at the college suggested high potential for attrition.

As of the first day of class, 1401 first-time students had enrolled for the fall semester at TNCC. Forty percent of these students (560 individuals) met the selection criteria of the subject study; having enrolled for nine or more semesters hours, and having scored below the cutoff on one of the three placement tests. The sample of 240 subjects represented approximately 43 percent of the accessible population.

The subjects were randomly selected and then randomly assigned to two groups. One of the two groups was randomly chosen to receive the intervention. From the original sample of 240, a total of 216 valid cases were included in the final analyses of the experimental results. Major characteristics of the sample are in Tables 2 through 5.

The sample was diverse with respect to age. Subjects ranged in age from 17 to 53 years. The majority were recent high school graduates (see Table 4). One-third were 18

Table 4

Sample Comparison Groups By Age

Group[a]	Mode	Median	Mean	SD
Control	18	19	21.77	5.67
Experimental	18	19	21.36	6.25

[a]n = 108 for each group

years old; 58.8 percent fell between the ages of 17 and 19. As a whole, the sample was younger than the average student at the college. This was a result of sample selection criteria which excluded students enrolled in less than nine semester hours. Students taking less than nine semester hours are more likely to be older, working adults. The selection standard of nine or more semester hours also accounted for the overrepresentation of full-time, day students within the sample as compared to the college population (see Table 3).

The sample was racially diverse. Other-race subjects listed in Table 5 included American Indian, Spanish American, and Asian American individuals. Compared to the general population of students at the college, there were more blacks in the sample (36 versus 23 percent) and a slightly higher proportion of females (61 versus 58 percent) as shown in Table 2.

Nearly half of the subjects (105) received tuition assistance in the form of financial aid. College-wide, approximately 40 percent of all students receive financial aid. The majority of subjects were enrolled in one of six college parallel transfer programs designed to satisfy the first two years of a four-year degree (see Table 3). The average course load (mean number of credits) for which the control and experimental groups had enrolled as of the first day of class was 12.64 and 12.69 respectively.

Table 5

Sample Comparison Groups By Gender And Race

	Control Group[a]		Experimental Group[a]	
	no.	%	no.	%
Male	42	38.9	43	39.8
Female	66	61.1	65	60.2
White	64	59.3	63	58.3
Black	40	37.0	38	35.2
Other	4	3.7	7	6.5
White Male	28	25.9	26	24.1
White Female	36	33.3	37	34.3
Black Male	12	11.1	14	12.9
Black Female	28	25.9	24	22.2
Other Male	2	1.9	3	2.8
Other Female	2	1.9	4	3.7

[a]n = 108

With respect to their mean scores on the placement test battery, the control and experimental groups were fairly equivalent upon entry to the college (see Table 6).

Table 6

Mean Placement Test Scores of Comparison Groups

Group[a]	CGP	SD	DRP	SD	DTMS	SD
Control	20.28	5.517	56.00	8.505	17.15	6.853
Experimental	20.75	5.346	55.73	8.135	17.62	6.432

[a]n = 108 for each group.
Note: See Instruments Section for description of tests.

Sample Size

Given the diversity of the population under investigation, a relatively large sample was chosen to increase the likelihood of a truly representative sample. Other issues also impacted decisions regarding sample size:

1. It was impossible for the investigator to control some of the important variables that could have an effect upon the research findings. These variables included classroom experiences and external influences on subjects such as employment status, family issues, health concerns, and financial exigencies. By using a large random sample, the uncontrolled variables were operating randomly for the two groups being studied and therefore should not have had a systematic effect on the results (Borg & Gall, 1989).
2. Based on previous related research (Kulik et al., 1983), small effect sizes were anticipated. If a smaller sample was used, the larger standard errors of the sample statistics could obscure small but important differences.
3. Relatively high attrition was expected. Institutional retention data on underprepared students indicated potential attrition of approximately 30 percent during the first semester.
4. The intervention method (telephone contact and direct mail) led to further loss of subjects. Students in both groups with disconnected phones or invalid addresses were deleted from analyses due to their inaccessibility.

Instruments

Assessment of Student Satisfaction

The American College Testing Program (ACT) Student Opinion Survey, Two-Year College Form, was used for this study to assess subject level of satisfaction. The Student Opinion Survey (SOS) was designed to explore perceptions of enrolled students regarding the programs, services, and environment of the institution with emphasis on the special needs of two-year colleges. The SOS is four pages in length, and consists of 44 self-report items divided into four sections. The sections are: 1) background information; (2) college impressions; 3) college services; 4) college environment. Sections III and IV ask respondents to rate their level of satisfaction by selecting one of six alternative responses. The available responses are: very satisfied, satisfied, neutral, dissatisfied, very dissatisfied, does not apply. Page 4 of the survey contains an additional section entitled "comments and suggestions." Here, blank lines are provided and students are invited to make comments and suggestions concerning the college.

Survey administration time is approximately 20 minutes. For this study, the instrument was administered through the mail. Scoring of the completed surveys was done commercially by ACT.

The ACT Student Opinion Survey was normed on 119,923 students at 256 colleges. It was developed by ACT staff

after literature review and consultation with expert practitioners in the relevant fields. The Pearson product-moment correlation coefficient between the average satisfaction ratings (for individual satisfaction-related items) obtained during a 1990 test-retest administration of the instrument was .95.

Regarding the validity of the Student Opinion Survey, according to the User's Guide (American College Testing, 1992):

> Validity of items in the instrument depends primarily on literature review, consultation with content experts, pilot testing of the instrument, and ACT's experience in instrument design and construction. Perhaps the most direct evidence of the face validity and content validity of the instrument lies in the items themselves. They are easy-to-read, straightforward questions that deal directly with particular aspects of the college. (p.16)

Validity coefficients were not reported. However, the SOS was judged to be the most appropriate instrument of those available for measuring student satisfaction because it is designed for community college students, is optically scannable, and contains questions pertinent to the study such as item 37, which asks subjects to rate their satisfaction with the college's "concern for you as an individual."

TNCC Intake Assessment Instruments

As stated earlier, subjects were identified as underprepared based on their scores on the institution's battery of placement tests. For identification of entering students in need of developmental course work the following tests are routinely administered as part of the college's mandatory intake assessment and placement process:

a. Degrees of Reading Power (DRP)

b. Descriptive Test of Mathematics Skills (DTMS) Arithmetic Skills Test

c. Comparative Guidance and Placement Program (CGP) Written English Expression Placement Test

Each of the tests is scored locally and published by The College Board and Educational Testing Service (ETS). Characteristics of the instruments are summarized below.

a. The Degrees of Reading Power, Form PA-2 (grades 9-12), measures reading comprehension. The test developer is Bertram Koslin of Touchstone Applied Science Associates, Bruster, New York. The instrument's major use is to predict probabilities of success for students in prose materials of varying difficulties. Specifically, DRP test questions engage those cognitive processes required to remember or locate, think about, analyze, derive, and/or combine test propositions. Test results are reported on a common score scale that can be interpreted in terms of text difficulty.

As evidence of its construct and predictive validity, the DRP correlates around .90 with the Word Completion Test.

The DRP also correlates with the California Achievement Test-70 at a range of .77 to .85. Further, all reported KR-20 and alternate-forms reliability coefficients range from .93 to .97. Standard error of measurement is 2.2. Administration time is 50 to 70 minutes.

Reviewers express confidence in the instrument as "among the best-conceived and carefully constructed measures of reading comprehension available" (Hanna, 1985) and describe it as "innovative and technologically advanced" (Bruning, 1985).

b. The Descriptive Test of Mathematics Skills, Form A, is designed for use with beginning students in two-year and four-year institutions. It was developed by a committee of educators for ETS. The purpose of the test is to measure specific skills needed to undertake college-level work. The instrument is intended to identify college students who need special help in math skills. Studies of the DTMS in which students were tested both at the *beginning* and at the end of remedial courses are reported in an article by Bridgeman (1981), who found that large gains in scores supported use of the test to assign students to remedial courses.

The test has four subscales. The DTMS Arithmetic Skills Test used by the college has a KR-20 reliability coefficient of .87, with a standard error of 2.1. This test consists of 35 questions, administered in 30 minutes. It is designed to measure students' knowledge of operations with

whole numbers, operations with fractions, operations with decimals; ration, proportion, and percent; and students' ability to apply arithmetic skills in solving word problems (Guide to the Use of the Descriptive Tests of Mathematical Skills, 1989). Predictive validity coefficients on the four subscales of the DTMS range from .44 to .86.

c. The CGP Written English Expression Placement Test was developed by ETS with an outside committee of educators. It is designed for use with students entering postsecondary institutions with open-door policies. Its major use is that of a self-scoring English placement test to "group students whose levels of attainment are similar and to offer courses appropriate to their needs" (Harris, 1984). It is a 25 minute test with 40 four-choice items measuring punctuation and syntax.

The CGP has a reliability of .85, obtained by K-R 20, with a 3.91 standard error of measurement. Predictive validity relating test scores to English course grades from the results of 42 individual studies reveal the median validity coefficients are approximately .38. Reviewers comment favorably about the self-scoring feature of the test and suggest that the "instrument appears an attractive answer to a perennial need" (Foley, 1984). While the instrument may be convenient, it would not have been the researcher's English placement test of choice given its disappointing level of validity.

Experimental Design

The design applied to this study was the posttest-only control group design (see Figure 1). This design was chosen because random assignment to groups was possible. The combination of random assignment and the establishment of a control group served to eliminate the majority of threats to both the internal and external validity of the study. Although mortality was a potential threat to internal validity not controlled for with this design, it did not prove to be a serious problem. Persistence was one of the variables under investigation, and a large sample was used to help offset anticipated attrition. A pretest was not administered since college placement test scores were available for checking initial group equivalence on academic preparation based on their knowledge of the basic skills.

R X O
R O

R=random assignment
X=experimental treatment
O=observation

Group	Assignment	n	Treatment	Posttest
1	Random	120	Early Contact	GPA, SOS[a] Credits # Enrolled
2	Random	120	No Early Contact	GPA, SOS[a] Credits # Enrolled

[a]ACT Student Opinion Survey

Figure 1. Experimental design.

The statistical hypothesis under investigation in this study was the null hypothesis, stated as follows:

Ho1: There is no difference between the experimental and control groups on first semester mean grade point averages.

Ho2: There is no difference between the experimental and control groups on mean number of productive grades earned in their first semester.

Ho3: There is no difference between the experimental and control groups on mean number of credits earned during their first semester.

Ho4: There is no difference between the experimental and control groups on number of students remaining at the end of the first semester.

Ho5: There is no difference between the experimental and control groups on number of students who returned for the following semester.

Ho6: There is no difference between the experimental and control groups on satisfaction attitude measures.

Variables of the Study

There were seven measures of the dependent variables and one independent variable under investigation. The early contact program was the independent variable, while measures of student success served as the dependent variables (see Figure 2).

Student Success

Achievement	Persistence	Satisfaction
GPA	Completed 1st Term	College in General
Productive Grades	Returned 2nd Term	Concern for You
Credits Earned		

Figure 2. Dependent Variables.

Nature and Location of the Data

This was a quantitative study in which both descriptive and inferential statistics were used to test the hypotheses. Personal and academic data for the subjects were gathered from the TNCC Admissions and Records Office. The Registrar supplied descriptive data (age, race, gender), placement test scores, first semester grade point averages, number of credits attempted and completed, number of productive grades, and enrollment status.

Subject satisfaction ratings were collected on the ACT Student Opinion Survey five-point (Likert) scale. The survey was administered by mail and scored by ACT.

Pilot Study

A preliminary trial of the research design, procedures, and measures was conducted during the spring semester 1992. In the pilot study, the entire experiment was carried out using a sample of 60 subjects assigned to two groups of 30. At that time, the institution was introduced to the intervention and program staff were trained.

Modifications were made to the main study as a result of the pilot study. Briefly, the types of modifications made were as follows:

1. The sample size was increased from 200 as forecasted in the research proposal, to 240 for the main study. Some loss of subjects due to withdrawal from college was expected. However, additional causes of subject attrition (subject inaccessibility and treatment failure) were experienced in the pilot study. Since according to the statistical rule of consistency, the margin of error decreases as sample size increases, the sample was increased to assure a sufficient number of valid cases.

2. The procedure for one aspect of the three-part intervention was revised. A letter was substituted for a phone call in the Peer Tutoring Project. This change is described in detail in the treatment section.

3. An additional measure of the dependent variable of achievement was incorporated in the procedure. Pilot study data analysis revealed a limitation with grade point average and number of credits completed with respect to assessing the achievement of subjects enrolled in developmental courses. Inclusion of the number of productive grades offset this limitation in that productive grades are not influenced by the absence of quality points. This modification is described in detail in the data collection section.

Procedures

The main effort of this experiment was directed toward a comparison of the effects of two approaches (treatments) toward new underprepared students at the college. The experimental group received the new treatment, while the control group was treated as usual. Following the intervention, analysis of the collected data was conducted to see if the new treatment was more effective with respect to student success than the traditional approach.

Sample Selection Procedures

At the beginning of the fall semester, a sample of 240 individuals was selected from the population of first-time underprepared students. A simple random sample procedure was used for selection where all the individuals had an equal and independent chance of being selected as a member of the sample. In an effort to assure initial equivalence between the two groups, random assignment was incorporated in the experimental design. The experimental group was formed in the same way as the control group. Following random selection and assignment, the group to participate in the early contact program was randomly chosen.

On August 24, 1992, the first day of class for fall semester at TNCC, an alphabetical computer list of all first-time students for fall was generated. The list contained approximately 1,400 student records. These student records were individually screened according to

placement test scores (academic preparedness) and number of credits of enrollment (nine or more). Students who were enrolled for less than nine semester hours or who had scored above the cutoff on all three of the college placement tests were excluded from consideration.

Students who failed to provide a phone number when they applied for admission and those who had not declared a major were not considered for this study. Any who had been identified for intervention in the college's summer transition program or the Gender Equity Program were also excluded due to possible unwanted effects.

Those who met the criteria to participate in the study (560 individuals) were listed alphabetically and numbered from one to 560. A table of random numbers was used to randomly select 240 students from the accessible population. Next, a die was used to randomly assign each of the subjects to one of two groups; even numbers went into one group, and odd numbers were assigned by chance to the other group. A coin toss determined which of the two groups received the experimental treatment.

The researcher avoided the use of existing groups. The use of volunteers was also avoided. Since the experiment was conducted in conjunction with the college's student success grant activity, subject permission to participate in the study was not required. However, in an effort to inform potential subjects of the experiment, an article describing

the study was published in the Fall 1992 TNCC New Student Newsletter. The researcher's name and phone number were included in the article. New students who preferred not to participate in the early contact program were asked to notify the researcher of their preference. No calls were received from students requesting to be excluded from the program.

Prior to beginning classes, subjects in both groups individually participated in the college admissions process. According to the college admissions policy, any person who has a high school diploma or the equivalent or who is 18 years of age or older and is able to benefit from a program of study at TNCC may be admitted. The admissions process consists of application and acceptance to the college, a mandatory assessment step during which the battery of placement tests is administered, initial academic advising and course placement by a professional counselor, course registration, and tuition payment. A one-credit college orientation course is required for all degree-seeking students (those who declared a major).

The admissions process at the college is conceptualized and operated from an institutional point of view. Procedures ensure that students meet the administrative information requirements for enrollment. In general, students receive little personal attention during the admissions process.

Treatment

The intervention received by the experimental group was the TNCC early contact program shown in Figure 3. The early contact program (ECP) was developed by a college-wide advisory committee in response to the college's low retention indicators (see Table 1).

The ECP was a series of college-initiated personal contacts with students during their first semester, designed to foster interaction between subjects and faculty, staff, and other students with the following objectives:

a. To personalize the academic environment for new students;
b. To help students identify positively with the college by conveying concern for them;
c. To encourage student involvement with the academic and social domains of the college.

Contacts were made by telephone and in person by student services personnel and faculty advisors. The telephone was targeted as a primary method for subject contact to test the effectiveness of telephone outreach strategies for commuter students as recommended in the retention literature (NIE, 1984; Noel et al., 1985; Tinto, 1987). Like most community college enrollees, TNCC students do not spend much time on campus. Also, since the college serves only the local geographic area, the majority of subjects could be contacted through a local telephone call.

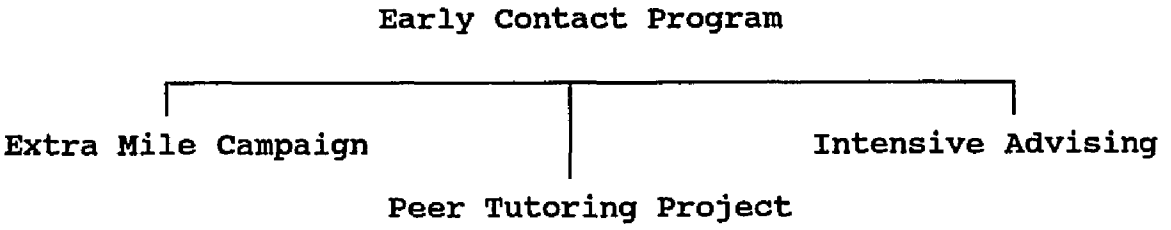

Figure 3. Treatment.

Components of the early contact program were:

1. **Extra Mile Campaign**

The Extra Mile Campaign was based on the theory that adult learners need to feel as though they matter to someone at the college in order to make a successful connection to the new environment. The purpose of the intervention was to lend support during the subject's transition to the college. The assumption was that by providing personal attention, feelings of alienation would be reduced.

During the first week of class for fall semester 1992, six student services staff members--two professional counselors, two admissions officers, a financial aid officer, and a career information specialist--received the names of 20 subjects[7] each from the experimental group. The six staff members volunteered to participate in the fall semester Extra Mile Campaign after having received training and experience during the spring 1992 pilot study.

---

[7]The subjects were randomly assigned to research assistants by dividing the alphabetical list of 120 members of the original sample into six equal groups of 20.

Along with the names of their subjects, research assistants received student profile sheets containing descriptive information and course enrollment data on each student. They were also given contact sheets to log telephone, in-person, and mail contacts with their assigned subjects. The six research assistants served as campus contacts and advocates for their subjects for the fall semester.

Their responsibilities included initiating at least three telephone contacts to correspond with critical transition periods during the first semester. The transition periods identified during the pilot study as critical stages for first-semester students were:

1. The course schedule adjustment period from the first to the 14th calendar day of the semester (the first two weeks of the term; weeks of August 24 and 31), when subjects were attending classes and experiencing the college environment for the first time.
2. Midway through the semester (the seventh week of the term; the week of October 5) during mid-term exams, when subjects were receiving initial feedback and indications of their progress in courses; two weeks prior to the withdrawal deadline.
3. Three-fourths of the way through the term (the 11th week of the term; the week of November 2), when term papers were

due and final exams were right around the corner; course schedules for next semester had recently been distributed.

The purpose of the first telephone contact was to introduce the caller as the subject's campus contact--the person to call in case of a question or problem--and to invite the student to come in for a voluntary personal meeting in September. During the initial contacts with the subject, the research assistant welcomed the student to the college, answered questions, provided encouragement, discussed add/drop procedures, and informed students of support services--especially the Tutorial Learning Center. The first contact was followed up with a personal note on college stationery. The note reinforced the message "I care about your success; call me if I can be of help." The research assistant's business card was enclosed, as well.

The purpose of the second call was to check in to see how the subject's semester was progressing, and to encourage involvement with campus activities. Subjects were reminded of tutorial services available to them as they prepared for mid-terms. The course withdrawal deadline was also discussed. If the subject expressed serious concern about passing a course, or indicated that he or she had stopped attending, they were advised to officially withdraw from the course to avoid receiving a failing grade.

The purpose of the third call was to provide encouragement and listen for issues and concerns. By now,

the subjects' early enthusiasm was tempered with reality regarding the rigor of college courses and the challenge of managing multiple priorities. Since early registration for the next semester was approaching, callers encouraged contact with the subject's faculty advisor, and discussed re-enrollment and withdrawal decisions. By this time, some subjects had already withdrawn from college. In these cases, the call served as a form of exit interview. Another purpose of the third call was to let subjects know that they would soon be receiving an opinion survey in the mail. Subjects were encouraged to participate in the survey.

Group meetings with the Extra Mile research assistants were held on August 25, October 21, and November 11 to monitor progress and share ideas. At meetings, research assistants submitted the names of those subjects who could not be contacted after several attempts. Either the subject's phone had been disconnected or they had not returned repeated messages left on answering machines or with family members. A total of five such cases were eliminated from final analysis. Extra Mile Campaign log sheets were collected by the investigator at the last meeting with research assistants.

On average, two call attempts were required for each contact actually made by the callers. Afternoon and early evening was the best time to find subjects at home. Frequently, family members of the subjects were reached by

telephone. Parents expressed appreciation for the individual attention shown to their offspring. Most subjects were surprised by the interest taken in them.

Approximately half of the subjects called their campus contacts back for information or for assistance in overcoming obstacles during the course of the study. Nearly one-third, made a personal visit to meet with their contact person. Examples of the type of support provided to subjects by the research assistants during this study were: arranging for a ride to campus when transportation fell through, navigating bureaucratic dilemmas, writing a letter of reference for a job interview, and coordinating with faculty on the subject's behalf.

Subjects in the control group received no systematic college-initiated contacts from personnel in the student services division. They received the usual passive treatment which left them to seek their own information and support from counselors and staff at the institution.

2. **Peer Tutoring Project**

The purpose of the Peer Tutoring Project was to make subjects actively aware of learning assistance services available to them at the college. The underlying assumption was that as underprepared students, the subjects were likely to need academic tutoring during their first semester. The intervention was also a means of fostering interaction between successful students (peer tutors) and subjects.

In the original research plan, peer tutors were designated to telephone a group of assigned subjects. The intended purpose of their call was to invite subjects to attend a group orientation and tour of the college's Tutorial Learning Center (TLC).

Based on the pilot study experience with this intervention[8], a decision was made to substitute a personal letter to each subject from their campus contact inviting them to the TLC (see the first letter in Appendix C). Campus contacts also spoke of the TLC during their telephone and in-person conversations with their assigned subjects. These personal reminders and the written invitation were used in the main study to serve the same purpose as the peer tutor's phone contact in the original research plan.

The letter was mailed on September 10, and offered free study skills materials as an added incentive to visit the TLC. Two TLC letters were received back in returned mail. These subjects were deleted from the study due to their inaccessibility.

Fifteen subjects in the main study actually received college-sponsored tutorial assistance during the course of the experiment. Many of the other subjects indicated to

---

[8]Peer tutors in the pilot study were found to be less successful than professional campus contacts at developing meaningful rapport with subjects by telephone. Tutors also reported that they were often not trained in the particular academic area in which their assigned subjects expressed interest for tutorial assistance.

their campus contacts that they knew the service was available if they needed it.

It is difficult to know why so few subjects accessed tutorial services during their first semester. Since the college does not issue mid-term grades, and has no form of "early alert" to warn students who are doing poorly, it is possible that subjects did not feel they needed tutoring. In support of that premise, subjects usually responded positively when campus contacts inquired about their progress in courses. However overall, the subjects' final grades did not bear out their accounts of satisfactory progress.

Subjects in the control group received no college-initiated contact regarding tutorial services. They received the usual passive treatment which left them to seek their own learning assistance from the college. There was no record of any of the control group members having requested nor received tutorial assistance based on the TLC's fall semester sign-in sheets.

3. **Intensive Advising**

The purpose of the intensive advising component of the ECP was to link subjects with their faculty advisors in a proactive way, rather than leaving their meeting to chance. College-initiated academic advising was a means of fostering interaction between subjects and faculty.

At TNCC, initial academic advising during the admissions process is performed by professional counselors. Later, degree-seeking students are assigned to faculty advisors who teach in the student's major field of study. First-semester degree-seeking students ordinarily try to meet their assigned faculty advisors for the first time when these students take steps to register for the upcoming semester. Because the registration period is hectic, contact between student and advisor is a hit-or-miss proposition. Since first-time students are unfamiliar with the registration process, they tend to have more difficulty negotiating the system than do continuing students. If the student and advisor meet at all, the encounter is typically brief and limited to course selection for the upcoming term. During their first semester at TNCC, students are unlikely to establish a relationship with their faculty advisor that communicates a personal interest.

In the spring 1992 pilot study, 44 full-time faculty members and all five of the academic division chairmen were introduced to the Intensive Advising component of the ECP. At the fall 1992 college convocation, an Intensive Advising seminar was conducted for faculty. Approximately 60 full-time faculty members attended.

A total of 58 faculty members had been assigned in the usual manner as advisors to the subjects in the experimental group. In mid October the advisors were given special

advising materials for this activity. The advising materials consisted of a student profile sheet and an advising contact sheet (log). Follow-up post cards (stamped and addressed) to advisees were also included in the advising materials (see the third entry in Appendix C). Each of the designated faculty advisors had an average of two first-time students to contact for Intensive Advising.

To encourage faculty cooperation with the Intensive Advising activity, academic division chairmen wrote memoranda requesting faculty support. The researcher also met individually with many of the faculty to monitor progress and solicit their feedback on the intervention.

In October, faculty advisors telephoned their new advisees who were members of the experimental group. The purpose of the call was to introduce the advisor and to set an advising appointment during the next two weeks. If attempts to contact the student by telephone were unsuccessful, faculty were asked to complete and mail the prepared post card asking that the student call them.

The purpose of the Intensive Advising meeting was to:

a. Discuss the subject's progress in current courses;

b. Discuss the subject's academic and career goals;

c. Work out a tentative curriculum plan;

d. Communicate interest in the student's success.

Advisors encouraged subjects to register early for the upcoming semester and to use their curriculum plan as a

guide in course selection. Advising contact sheets were collected by the investigator on November 6.

According to faculty comments on the advising contact sheets, attempts were made to contact all but five of the subjects in the experimental group. These five cases were deleted from final analyses due to treatment failure. Of the remaining 108 subjects, 71 met with their faculty advisors for intensive advising. Some of these subjects had already withdrawn from their fall semester classes, but were evidently looking ahead to future semesters at the college.

Subjects in the control group received the usual passive treatment. That consisted of no advisor-initiated contact during their first semester. Control group members were left to seek advising services on their own.

Data Collection

The Student Opinion Survey was mailed to sample members on November 9 to collect comparative data regarding their satisfaction with the college. Prior to mailing, subjects' social security numbers were "bubbled in" to facilitate survey tracking. The instrument was sent by first class mail in a bright yellow 8 1/2" x 11" envelope, accompanied by a cover letter addressed to the subject (see the second letter in Appendix C). In the letter, a deadline date of November 23 was given by which to return the survey in the enclosed stamped, addressed envelope. A number two lead pencil was also enclosed for use by respondents.

To provide additional incentive to reply, the names of respondents who returned the survey by the deadline were included in a drawing for a $25 gift certificate at the college bookstore. Drawing entry forms were completed in advance with the student's name and address filled in. The subjects had only to tear off the entry form and return it with the completed survey.

Sixty-five completed surveys were returned by the deadline. To improve the response rate, the first follow-up strategy was a reminder postcard mailed to nonrespondents on November 24 (see the last entry in Appendix C). The postcard indicated that the drawing had been postponed until December 8 to allow time for their entries. Subjects were asked to call if they had misplaced their survey so that another one could be sent. No such calls were received. This effort yielded 39 additional surveys. The drawing was held as scheduled, and the winner (a member of the control group) was notified.

Initially 228 surveys were mailed: 120 to the original control group, and 108 to the remaining valid cases (see Figure 4) in the experimental group[9]. Eight surveys to control group members were received back from the post office as returned mail. These subjects were deleted from

---

[9]As described earlier, a total of 12 experimental group members had been deleted from the study due to their inaccessibility by phone or mail, or due to treatment failure.

analyses. Before conducting the final follow-up activity, six more members of the control group were systematically eliminated[10] in an effort to return the comparison groups to equal sizes.

During the week of December 7, the investigator and an administrative assistant funded by the student success grant telephoned nonrespondents and asked that the survey be completed and returned. The investigator contacted members of the experimental group, while the administrative assistant contacted nonrespondents in the control group. The administrative assistant's calls, in particular, were strictly limited to a reminder of survey participation.

By the end of the year, a total of 155 surveys had been returned (78 from the control group and 77 from the experimental group), resulting in a 72 percent rate of response for the final sample. Completed surveys were subsequently prepared for processing and sent to ACT to be scored. A summary report presenting the results of the survey was received by the researcher in mid-January.

In January 1993, posttest measures were taken on the remaining dependent variables according to the research timetable (see Figure 5). Data regarding subjects' grade point averages, number of productive grades, credits earned

---

[10]A die was used to obtain a starting point on the alphabetical list of control group members. Every 20th individual including the individual at the starting point was deleted from the list.

in the first semester, number of subjects who completed the first semester, and number of subjects who were enrolled on the first day of class for spring 1993 were gathered from the Registrar's Office. These data were organized on comparison group summary sheets and compiled to facilitate statistical analysis.

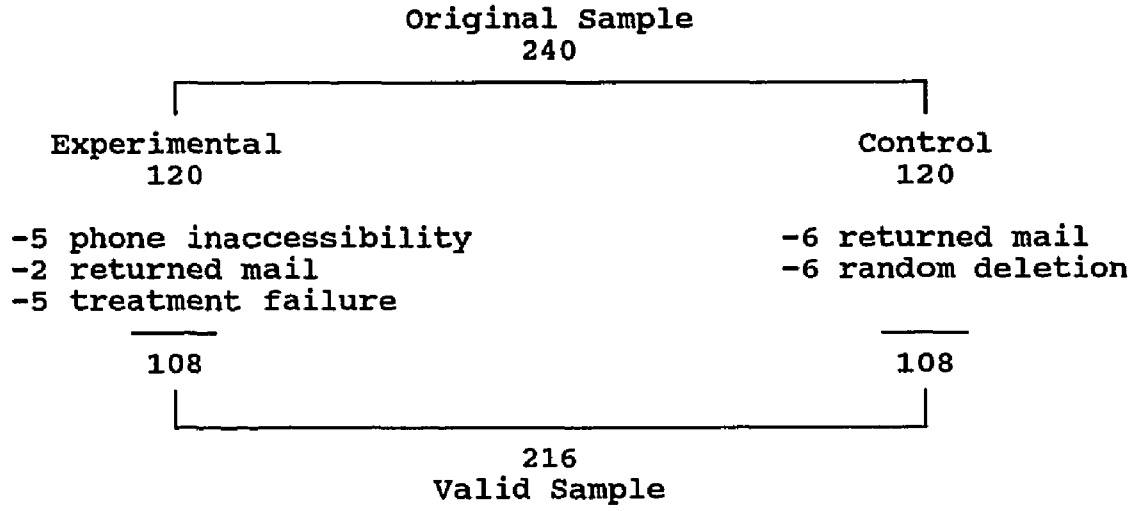

Figure 4. Description of Valid Sample.

For the main study, an adjustment was made in the procedure for measuring subjects' first-semester achievement. The original research plan called only for analysis of grade point average and number of credits earned. Experience with analysis of the pilot study results revealed that grade point average and number of credits earned were limited assessments of the dependent variable of achievement.

The limitation stemmed from the fact that developmental courses do not count toward graduation. As a result, developmental courses do not assign quality points toward the subject's GPA, nor do they award course credits. Grades of S (satisfactory), R (re-enroll), and U (unsatisfactory) are given for developmental courses, with no quality points.

Since the subjects were academically underprepared when they entered the institution, nearly all of them were required to enroll in at least one developmental course. To offset this limitation, the measure of the number of productive grades earned by subjects in the sample was included as an assessment of achievement. In this way, developmental course grades were also included in the analysis, more accurately reflecting subject achievement.

Analysis

Upon completion of the collection procedure, data were analyzed to answer the seven research questions. Descriptive and inferential statistical procedures were performed. Three types of measurement scales were represented by the data:

1. Retention data were nominal since they classified subjects into two enrollment status categories--enrolled and not enrolled. Chi-square test of association was the statistical test for significance.

2. Grade point average, number of productive grades, and credits earned are ratio data since equal intervals and

a true zero point exist for both. The t-test for independent groups was used to test for significance.

3. Rating summaries for individual item analysis of the standardized opinion survey are interval data. The t-test for independent groups was applied as the test for significant difference between mean scores on two individual survey items.

Tests of significance were one-tailed, assuming that if a difference occurred it would be in favor of the experimental group (A>B). If the individual tests for significance resulted in differences that were significantly greater than chance differences at the .05 probability level, the null hypothesis was rejected; if not, the null hypothesis was accepted.

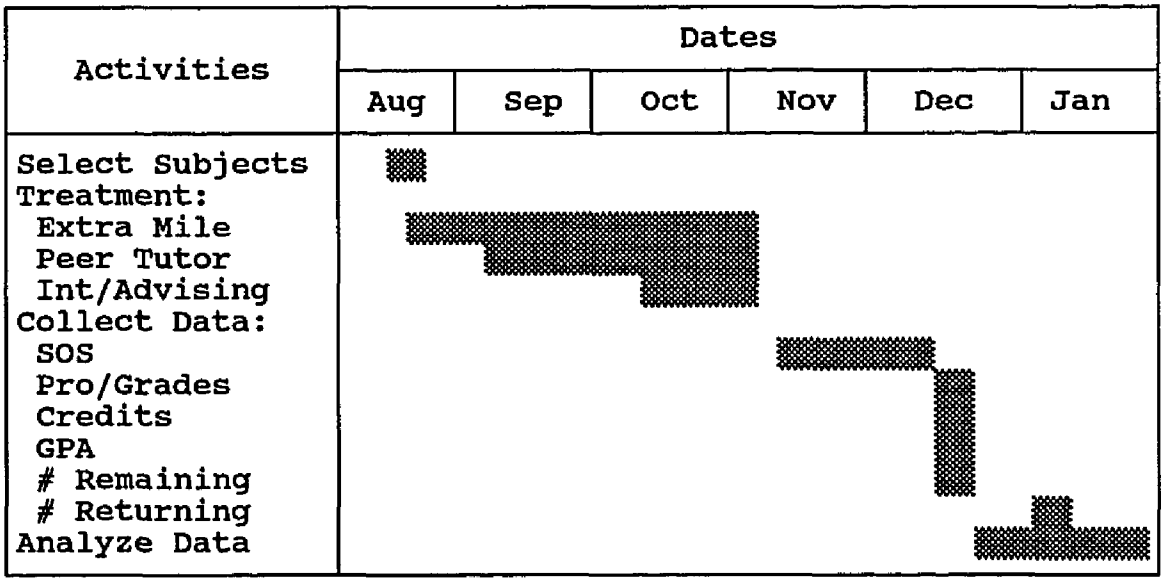

Figure 5. Research Timetable.

Limitations of the Study

This was an extensive study involving 240 students and 65 research assistants. Institutional commitment to improving student success with the help of a three-year grant greatly facilitated the research. Replication of the research might prove difficult due to the unique set of circumstances afforded by the grant initiative.

The specific nature of the setting and the treatment may limit ability to generalize beyond the experimentally accessible population. For example, the early contact program (the independent variable) was designed to address the service gaps impacting student persistence at this institution. The three-part intervention was a new treatment toward first-time underprepared students at this college. At another institution, some aspects of the early contact program might represent the usual treatment for new students.

However, there is much less concern over the specificity of the dependent variables. The study's measures of achievement, persistence, and satisfaction have broad application in evaluating student success. While grade point average is an inconclusive criterion influenced by course selection and relative course difficulty (Borg & Gall, 1989), it is the criterion used by most institutions to report academic performance.

On the issue of experimental control, the amorphous "caring person variable" was the gist of the treatment. While the treatment set the stage for conveyance of personal interest, actual implementation of the effect was subject to the personal styles of the research assistants. Nor could the researcher control for the perceptions of the experimental subjects regarding the intervention. Some may have viewed the contact they received as an imposition or as coddling. Analysis of the item on the student opinion survey asking subjects to rate the institution's concern for them as an individual was an attempt to measure their perception of the treatment. However, extraneous college experiences, such as an indifferent instructor or a rude staff member, could have mitigated subject responses.

Furthermore, the impact of the treatment was affected by the subjects' willingness to avail themselves of opportunities being offered via the early contact program. Some chose not to meet with their advisor or campus contact. Many did not use tutorial services. While the research accomplished the goal of proactive behavior toward students, the experimental results were impacted by the subjects' level of involvement with the program.

Another possible limitation of the study is duration of the treatment. Subjects were exposed to the intervention for a total of 11 weeks. Was this a sufficient period of time for the treatment to make a difference with respect to

student success? Is 11 weeks long enough for subjects to have formed an opinion about the college?

Since measurement of the dependent variables occurred at the end of the semester, it is difficult to draw final conclusions about the long-term effects of the independent variable on student success. However, since over half of college student attrition occurs in the first semester (Fund for the Improvement of Postsecondary Education, 1992), and since most students who leave an institution during the first year make the decision to do so early in their first semester (Noel et al., 1985), focus of the research on the first 11 weeks of college experience appeared warranted.

CHAPTER 4

ANALYSIS

To investigate the effects of an early contact program on the success of new underprepared community college students, statistical analyses were conducted and data were analyzed accordingly. The results of these analyses are presented in this chapter.

SYSTAT was the computer program used to perform the majority of statistical tests for significance. The number of subjects in the research data base was 216, with 108 subjects in each groups. A profile of nonpersisters (those from the sample who left the college) is provided in the supplemental analyses section of this chapter.

Results

Achievement

To compare the posttest results of the experimental and control groups on the dependent variable of achievement, a one-tailed (A>B) t-test for independent samples was used. The preselected alpha level was .05. This statistical technique was applied for all eight of the tests for significance on the various measures of student achievement

because it was believed that assumptions required for use of a parametric test were met. For example, subjects were randomly assigned to groups.

With respect to the criterion variable of first-semester grade point averages (GPA), it was found that the means of the two groups differed significantly as shown in Table 7. The t-value was greater than the t-table value of 1.658. Therefore, the research hypothesis that students who participate in an early contact program achieve higher first-semester grade point averages than students who do not participate was supported.

Table 7

Grade Point Average Means, Standard Deviations, and t for the Experimental and Control Groups

	Groups[a]			
	Exp GPA	Con GPA	df	t-value
M	1.788	1.187	214	3.696*
SD	1.14	1.25		

[a]*n* = 108 for each group.
*$p < .05$

These results are not surprising considering the fact that control group members experienced significantly higher attrition during their first semester than those in the

experimental group (see Table 15). In nearly every case, subjects who withdrew from the college during their first semester received a semester GPA of 0.00. The grade point averages of nonpersisters decreased mean grade point averages for both the experimental and the control groups. In this way, findings on the dependent variable of achievement were impacted by subject persistence. However, since three times as many control group subjects withdrew from the college (30 subjects versus 10), negative results were weighted in the direction of the control group.

To determine whether or not the independent variable made a true difference on the grade point averages of the comparison groups, a test for significance was performed using only the grade point averages of the persisters in each group.

The statistical procedure applied was the one-tailed t-test for independent samples. Since comparison group sizes were not equal for purposes of this test ($n_1 = 98$; $n_2 = 78$), results were weighted by group sizes.

It was found that the mean grade point averages still differed significantly after controlling for attrition (see Table 8). The null hypothesis regarding first-semester grade point averages was rejected without qualification.

Grade point averages were by themselves an incomplete measure of achievement since most subjects were enrolled in one or more developmental courses which awarded no quality

Table 8

Grade Point Average Means, Standard Deviations, and t for Persisters in the Experimental and Control Groups

	Groups			
	Exp GPA[a]	Con GPA[b]	df	t-value
M	1.971	1.643	174	1.927*
SD	1.035	1.188		

[a]*n* = 98
[b]*n* = 78
*$p < .05$

points. For example, a subject may have successfully completed three developmental courses, yet have earned a GPA of 0.00 for his or her first semester. To compensate for this limitation in assessing the dependent variable of achievement, a comparison of the number of productive grades earned by each group was conducted. By comparing data on the number of productive grades earned, it was possible to evaluate group performance on developmental courses as well as on college-level courses.

The test for significance established that the means of the two groups differed significantly (see Table 9). Therefore, the research hypothesis that students who participate in an early contact program achieve a higher number of productive grades in their first semester than students who do not participate was supported.

Table 9

Productive Grades Means, Standard Deviations and t for the Experimental and Control Groups

	Groups[a]			
	Exp PG	Con PG	df	t-value
M	2.843	2.130	214	3.237*
SD	1.554	1.681		

[a]n = 108 for each group.
*p < .05

As with GPA, findings regarding productive grades earned were impacted by subject persistence. Nonpersisters earned nonproductive grades in nearly all of their courses, both developmental and college-level.

To determine whether or not the early contact program made a true difference with respect to the number of productive grades earned by the comparison groups, a test for significance was performed using only the number of productive grades earned by the persisters in each group.

Using the one-tailed, t-test for independent groups, it was found that performance of the two groups did not differ significantly (see Table 10). Therefore, the null hypothesis regarding number of productive grades earned was rejected with qualification.

Table 10

Productive Grades Means, Standard Deviations and t for Persisters in the Experimental and Control Groups

	Groups			
	Exp PG[a]	Con PG[b]	df	t-value
M	3.092	2.833	174	1.218*
SD	1.363	1.427		

[a] $n = 98$
[b] $n = 78$
*$p > .05$

For this study, the third measure of subjects' academic achievement was the number of first-semester credits earned. Two tests for significance were done on this criterion variable. One analysis considered college credits only. The other test compared group differences on combined developmental and college credits completed.

Since developmental courses do not count toward graduation, credits for their successful completion are not reflected on the student's transcript. Results of the analysis of college credits earned and the combination of developmental and college credits completed are shown in Tables 11 and 12 respectively.

On both measures of credits earned, it was found that the means of the two groups differed significantly, even

Table 11

College Credits Earned Means, Standard Deviations, and t for the Experimental and Control Groups

	Groups[a]			
	Exp Credits	Con Credits	df	t-value
M	6.472	3.926	214	4.459*
SD	4.146	4.246		

[a]n = 108 for each group.
*p < .05

Table 12

Combined Developmental and College Credits Completed Means, Standard Deviations, and t for the Experimental and Control Groups

	Groups[a]			
	Exp Combined	Con Combined	df	t-value
M	8.787	6.222	214	4.064*
SD	4.347	4.911		

[a]n = 108 for each group
*p < .05

when controlling for attrition (see Tables 13 and 14). Therefore, the research hypothesis that students who participate in an early contact program achieve a higher

number of college credits in their first semester than students who do not participate was confirmed.

Table 13

College Credits Earned Means, Standard Deviations, and t for Persisters in the Experimental and Control Groups

	Groups			
	Exp Credits[a]	Con Credits[b]	df	t-value
M	7.112	5.321	174	2.918*
SD	3.804	4.229		

[a]n = 98
[b]n = 78
*p < .05

Table 14

Combined Developmental and College Credits Completed Means, Standard Deviations, and t for Persisters in the Experimental and Control Groups

	Groups			
	Exp Combined[a]	Con Combined[b]	df	t-value
M	9.663	8.397	174	2.230*
SD	3.529	3.903		

[a]n = 98
[b]n = 78
*p < .05

Persistence

To compare the posttest results of the experimental and control groups on the dependent variable of student persistence, a two-dimensional (2 x 2) chi-square (x^2) test of association was applied. The preselected alpha level was .05. This statistical technique was used in both tests for persistence because the data were nominal taking the form of frequency counts occurring in four discrete mutually exclusive categories.

With respect to the persistence of comparison group members as measured by the number of subjects who completed their first semester, it was found that performance of the two groups differed significantly (see Table 15). Since the chi square value was greater than the chi square table value of 3.841, it was concluded that some association existed between persistence and the comparison group to which the subject belonged. Therefore, the research hypothesis that students who participate in an early contact program are more likely to complete their first semester at the college than students who do not participate was supported.

The second measure of student persistence in this study was the number of subjects in both groups who returned to the college the following semester (spring 1993). On the dependent variable of persistence as measured by the number of subjects who returned for their second semester, a significant difference between the groups was found as shown

Table 15

Comparison of the Number of Subjects in the Experimental and Control Groups Remaining at the End of First Semester

Groups[a]					
Exp Remaining	%	Con Remaining	%	df	x^2-value
98	90.7	78	72.2	1	12.272*

[a]n = 108 for each group.
*p < .05

in Table 16, causing the null hypothesis to be rejected. The research hypothesis that students who participate in an early contact program are more likely to enroll for the second semester at the college than students who do not participate was confirmed.

Table 16

Comparison of the Number of Subjects in the Experimental and Control Groups Who Returned for Second Semester

Groups[a]					
Exp Returning	%	Con Returning	%	df	x^2-value
96	88.9	79	73.1	1	8.698*

[a]n = 108 for each group.
*p < .05

Satisfaction

To compare the results of the comparison groups on the dependent variable of student satisfaction, a one-tailed (A>B) t-test for independent samples was used as the test for significance. The preselected alpha level was .05. This statistical technique was applied to two questions from the ACT Student Opinion Survey. Scores were represented in the form of responses on a five-point Likert scale. Mean differences in group scores were analyzed accordingly.

Regarding subject level of satisfaction on Item 44 of the survey asking them to rate their satisfaction with "this college in general," it was found that the mean scores of the two groups did not differ significantly (see Table 17). In fact, the two groups had identical mean scores on this survey item. Therefore, the research hypothesis that students who participate in an early contact program express a higher level of satisfaction with the college's programs and services than students who do not participate was not confirmed.

With respect to subject satisfaction on Item 37 of the student opinion survey asking them to rate their satisfaction with the college on "concern for you as an individual," it was again found that the mean scores of the two groups did not differ significantly (see Table 18). Therefore, the research hypothesis that students who participate in an early contact program express a higher

Table 17

General Satisfaction Score Means, Standard Deviations and t for the Experimental and Control Groups

	Groups			
	Exp Score[a]	Con Score[b]	df	t-value
M	4.30	4.30	153	0.0*
SD	.66	.60		

[a]n = 77
[b]n = 78
*p > .05

level of satisfaction with college's concern for them as individuals than students who do not participate was not supported.

Table 18

Individual Concern Satisfaction Score Means, Standard Deviations, and t for the Experimental and Control Groups

	Groups			
	Exp Scores[a]	Con Scores[b]	df	t-value
M	4.24	4.04	153	1.639*
SD	.80	.72		

[a]n = 77
[b]n = 78
*p > .05

Supplemental Analyses

Descriptive statistics were applied to summarize the characteristics of nonpersisters in the comparison groups and in the total sample. Forty subjects (18.5 percent) from the sample dropped out of college during their first semester. Forty-one sample members (19 percent) did not return to the college for the second semester. Descriptive data for subjects in both categories of attrition are provided in Tables 19 through 22.

Table 19

Summary By Age of Subjects Who Left First Semester

	Exp Age[a]	Con Age[b]	Sample Age[c]
M	25	22.1	23.6
SD	10.41	4.66	7.53

[a] n = 10
[b] n = 30
[c] n = 40

Some of the subjects were represented in both categories of attrition. Twenty-seven individuals who withdrew from their first semester, also did not return for their second semester. However, the pattern is not consistent. Thirteen subjects in the sample who completed the first semester, did not return for the second semester.

Conversely, 13 different individuals from the sample who failed to complete the first semester, did return for the second semester.

Table 20

Summary By Gender & Race of Subjects Who Left First Semester

	Experimental[a]		Control[b]		Sample[c]	
	no.	%	no.	%	no.	%
Male	3	30	11	37	14	35
Female	7	70	19	63	26	65
White	3	30	11	37	14	35
Black	5	50	19	63	24	60
Other	2	20	0	0	2	5

[a]n = 10
[b]n = 30
[c]n = 40

Table 21

Summary By Age of Subjects Who Did Not Return Second Semester

	Exp Age[a]	Con Age[b]	Sample Age[c]
M	26.25	21.48	23.87
SD	10.39	4.17	7.28

[a]n = 12
[b]n = 29
[c]n = 41

Table 22

Summary By Gender & Race of Subjects Who Did Not Return Second Semester

	Experimental[a]		Control[b]		Sample[c]	
	no.	%	no.	%	no.	%
Male	3	25	12	41	15	37
Female	9	75	17	59	26	63
White	6	50	14	48	20	49
Black	5	42	14	48	19	46
Other	1	8	1	4	2	5

[a] n = 12
[b] n = 29
[c] n = 41

Summary

To answer the research questions, statistical analyses were performed and data analyzed. Results of the analysis indicated that at the end of 15 weeks, the comparison groups differed significantly in performance on the dependent variables of achievement and persistence.

However, when controlling for attrition, the average number of productive grades earned by each group was not found to differ significantly. The comparison groups also did not differ significantly in performance on the dependent variables for satisfaction. Analysis of descriptive data established that among sample members, older black females were least likely to persist at the college. This finding was true for both the experimental and the control group.

CHAPTER 5

DISCUSSION

This chapter presents a summary of the study, the relation of these findings to previous research, interpretations of the findings, and implications for future policy and practice. The discussion concludes with an examination of results in relation to limitations of the study and suggestions for further research.

Current Research

The purpose of this study was to investigate the effects of an early contact program on the success of new underprepared community college students. While open door admissions policies assure access to higher education, 73 percent of community college students leave before completing an associate degree (Tinto, 1987). Additionally, students at two-year colleges are far less likely than their peers at four-year colleges to complete a bachelor's degree and to reap the associated benefits (Richardson & Bender, 1987). As compared to residential students, community college students spend less time on campus and have less interaction with faculty, staff, and other students.

Based on existing theory and on review of the pertinent research and literature, it was hypothesized that first-time underprepared community college students who participate in a program which provides personal contact and support would exhibit greater academic achievement, persistence, and satisfaction than their cohorts who were left to seek their own support and assistance from the institution. Answers to seven research questions were sought.

To answer the research questions and test the hypothesis, the current study undertook a controlled experiment using a posttest-only control group design. Two-hundred-forty college entrants were randomly selected from a population of approximately 1,400 first-time students at an urban community college in eastern Virginia. Members of the sample were randomly assigned to two groups of equal sizes. Since the two groups were randomly formed, they were essentially the same at the beginning of the study with respect to performance on the dependent variables.

First-time underprepared students were targeted for investigation because they were assumed to be at greater risk of failing to complete their educational objectives than the general population of community college students. The treatment consisted of a series of college-initiated personal contacts with experimental subjects (n = 108) during their first semester. These contacts were designed to foster interaction between subjects and faculty, staff,

and other students. Activities included a form of telephone counseling, academic advising, and peer tutoring. Contacts were made by telephone, in person, and by direct mail. After the procedures were executed, statistical analyses of the comparative outcome data on seven measures of the dependent variables were performed using the one-tailed t-test for independent samples and the chi square test of association. The preselected alpha level was .05.

Analysis of the data established that at the end of 15 weeks, the comparison groups differed significantly in performance on the dependent variables of achievement and persistence. Therefore, results of this study support the original hypotheses which predicted improved student achievement and persistence for those in the early contact program.

However, data collected from the comparison groups on the dependent variable of satisfaction were not found to be statistically significant. Results of this study did not support the original hypothesis which predicted improved student satisfaction with the college by those who participated in the early contact program.

Achievement

The first research question asked if students who participate in an early contact program achieve higher first-semester grade point averages than students who do not participate in the program. The mean GPA achieved by the

experimental group members was .6 grade points higher than the mean GPA achieved by control group members (1.788 versus 1.187).

The results were not only statistically significant, but also practically significant. Without satisfactory grades, a student will not graduate from college, nor will she or he be admitted for transfer to a senior institution. Furthermore, satisfactory grades are required in order to continue receiving financial aid and Veteran's benefits. Individuals who participated in the early contact program failed less often than their peers who were given the traditional treatment.

Since findings on the dependent variable of achievement were impacted by subject persistence, another test for significance was conducted using only the grade point averages of the persisters in each group. While magnitude of the difference in performance between the two groups was less when controlling for attrition, the results were still found to be statistically significant. In practical terms, experimental group persisters achieved an average of .3 grade points higher than control group persisters at the end of the first semester (1.971 versus 1.643).

These findings were substantiated in the second research question which asked whether students who participate in an early contact program achieve a higher number of productive grades in their first semester than

students who do not participate. Productive grades reflect achievement in developmental (remedial) as well as college-level courses.

Experimental group members achieved an average of .7 more productive grades than did the control group members (2.843 versus 2.130). This represents a 25 percent increase in productive grades for those who participated in the early contact program. The results were not only statistically significant, but also practically significant. Productive grades are required for students to satisfy prerequisites and to go on to higher-level college work. Courses for which unproductive grades are earned must be repeated. This, in turn, causes a delay in progress toward degree completion.

The problem of low success rates in developmental courses is exacerbated by a new state-wide mandate allowing only one repeat attempt in developmental courses (Strategic Planning Task Force, 1990). Within the VCCS, the door to higher education closes when a productive grade is not achieved after the second attempt at course completion.

As with the GPA analysis, an additional test for significance was conducted using only the number of productive grades earned by persisters in the comparison groups. When controlling for attrition, experimental group persisters were found to have attained an average of .26 more productive grades than the control group persisters

(3.09 versus 2.83). This represents an eight percent increase in productive grades for persisters who participated in the early contact program.

This finding was affirmed by the third research question which asked if students who participate in an early contact program achieve a higher number of college credits in their first semester than students who do not participate. On average, program participants earned 2.5 more college credits than members of the control group (6.47 versus 3.93). These results had statistical as well as practical significance. First-semester students who participated in the program realized a greater return on their educational investment of time and money. At the end of one term, they had achieved college credit amounting to nearly an entire course more than their cohorts.

When considering mean number of credits completed for both college and developmental courses, the students who participated in the program out-performed those who did not by approximately 2.6 credits (8.79 versus 6.22). Persisters in the experimental group earned 1.8 more college credits than those in the control group and acquired 1.3 more credits when both college-level and developmental courses were combined.

The findings suggest that students who participate in an early contact program are more likely to succeed academically. These results are noteworthy since an

increase of even a few grade points or credits represents major savings considering the size of the experimental group. On a human level, success is also very encouraging.

Persistence

Achievement and persistence are interrelated. Students who leave college cannot earn productive grades or college credits, nor complete a degree. Conversely, when students fail, they are more likely to leave college, and in many cases, leave higher education altogether.

The fourth research question asked if students who participate in an early contact program are more likely to complete their first semester at the college than students who do not participate. Nearly 91 percent of the subjects in the experimental group completed the first semester as compared to 72 percent in the control group.

These results were not only statistically significant, but also practically significant. Twenty more students in the early contact program than in the control group chose to stay in school until the critical first semester ended, representing an improved within-semester retention rate for program participants of 18.5 percent. In nearly every case, subjects who withdrew from the college during their first semester received a cumulative GPA of 0.00. Nonpersisters generally achieved no productive grades, nor did they complete any developmental or college courses.

Consequently, subjects who withdrew from their first semester had little to show for approximately $500 in tuition or financial aid benefits remitted to the college at the beginning of the term.

Results of the current research indicate that individuals who withdrew from their first semester, were unlikely to return for the second semester. This was true in 67.5 percent of the cases of attrition in the sample. One possible explanation is that the educational goals originally held by individuals who failed to persist had been abandoned or set aside indefinitely.

In this study however, 32.5 percent of those who withdrew from college during their first semester returned to college the following semester. While re-enrollment was a positive step, these subjects are at a disadvantage as compared to those who successfully completed their first semester. Future grades earned by the first-semester nonpersisters will be averaged with their fall semester GPA of 0.00. For purposes of employment and transfer to other accredited institutions, their transcripts will remain an historic record, reflecting a poor start in college.

The fifth research question considered subject persistence between their first and second terms. It asked whether students who participate in an early contact program are more likely to enroll for the following semester at the college than students who do not participate. Nearly 89

percent of the subjects in the experimental group enrolled for the following semester as compared to 73 percent of the subjects from the control group.

These results were significant in practical as well as in statistical terms. Seventeen more subjects chose to return to college for their second semester, representing an improved between-semester retention rate for program participants of 15.8 percent. In general, those who returned for the second semester were still on track with their educational objectives. Subjects who persisted were making steady progress toward degree completion.

The findings suggest that subjects who participate in an early contact program are more likely to stay in college. These results are noteworthy because retention of even a few additional students represents major savings for an institution given the relative costs of recruiting new students. While it is difficult to estimate the personal impact of improved first-semester persistence, retention researchers agree that students' experiences during their first year of college largely determine their academic success in subsequent years.

Satisfaction

The sixth research question asked if students who participate in an early contact program express a higher level of satisfaction with the college's programs and services than students who do not participate. It was found

that the average general satisfaction ratings for survey respondents in the experimental and control groups were identical. Members of both groups indicated a relatively high level of satisfaction with the college, averaging 4.3 on a five-point scale. A rating of five meant "very satisfied," while four indicated that the respondent was "satisfied" with the college in general.

These findings were substantiated to some extent by the seventh research question which asked whether students who participate in an early contact program express a higher level of satisfaction with the college's concern for them as individuals than students who do not participate. Survey respondents in the experimental group (n = 77) expressed an average satisfaction level of 4.24 on a five-point scale. Control group respondents (n = 78) scored an average of 4.04 on the same question. These results were not statistically significant.

Characteristics of Nonpersisters

A supplemental analysis of the characteristics of nonpersisters indicated that the clearest set of overall effects among nonpersisters concerns race and gender. Attrition in both groups was highest among women and blacks. However, since the control group experienced three times as much attrition as the experimental group (30 subjects versus 10), the largest increase in retention rates occurred among black females in the experimental group.

The most striking difference between nonpersisters in the two test groups were their ages. Experimental subjects who left during the first semester were on average older than control subjects who withdrew (25 years versus 22.1 years). Differences in mean age were also observed in those who failed to return for the second semester. Program participants who did not return for the second semester averaged 26.3 years of age, while control group members averaged 21.5 years. In practical terms, it appears as though the intervention favored traditional-age college students. However, it is possible that other factors influencing subjects' lives (for example, the older, black women) may also account for their lack of persistence.

Relation to Previous Research

College impact models of student change, as shown in Appendix A, assign a prominent role to the context in which the students learn. Students are seen as active participants in the learning process, but the environment is also seen as a vital force. College impact models place emphasis on the frequency and content of the students' interactions with faculty, staff, and other students (Astin, 1985a; Tinto, 1987; Pascarella, 1985; Weidman, 1989). The theory of mattering and marginality stresses the students' need to feel as if they matter in order to achieve and persist in higher education (Schlossberg, 1989).

In an attempt to evaluate the effectiveness of special programs for high-risk college students, several studies have examined the achievement and persistence of program participants. A meta-analysis of these findings verifies that college programs for underprepared students have positive effects on achievement and persistence, but the effect size for community colleges was found to be relatively small (Kulik, Kulik, & Shwalb, 1983).

Kulik and associates (1983) note, however, that the overall effect is greatest during the freshman year, with supportive interventions being significantly more effective than other strategies. These and other findings (for example, Abrams & Jernigan, 1984; Earl, 1987; Glennen & Baxley, 1985; Kirschenbaum & Perri, 1982; Simpson, 1988; Walsh, 1985) concerning the positive effects of supportive interventions on both grades and persistence are consistent with the current research.

Within the literature, evidence is mixed regarding the importance of social and academic integration as a factor in community college student persistence. On this issue, the current research is consistent with the opinions and findings of Tinto 1987, 1988; Pascarella, Smart, and Ethington, 1986; and Neumann, 1985 who provide evidence that social and intellectual contact is a significant factor in persistence behavior. Conflicting data from research by Bean and Metzner, 1985; Spanard, 1990; and Voorhees, 1987

suggests that social and academic integration does not have an independent effect on community college persistence.

In the current research, early contact program participants experienced higher achievement and persistence, supporting the views of Tinto (1987) who first described the purpose and benefits of an early contact program in his work Leaving college: Rethinking the causes and cures of student attrition. The findings further support the conclusions of Astin, 1985a; Boyer, 1987; Beal and Noel, 1980 concerning the importance of proactive personal contact with entering college students. While use of the telephone as the primary method for commuter student contact had its limitations, the current research did confirm the telephone's effectiveness as a tool for retention outreach as recommended in the literature (National Institute of Education, 1984; Noel et al., 1985; Schlossberg, Lynch, & Chickering, 1989).

Levitz and Noel (1989), and Tinto (1987) estimate that with a successful retention program, it is reasonable to expect a 10 to 20 percent gain in the proportion of entering students who persist in college. The current research yielded an 18.5 percent gain in the within-semester retention rate; a 15.8 percent gain in the between-semester retention rate for the entering students under investigation. Overall, those least likely to persist were minority students, a finding consistent with national retention statistics (Pascarella & Terenzini, 1991).

Implications for Policy and Practice

As a nation, we espouse equal access to education. Underlying this vague concept is the assumption of personal responsibility for learning outcomes, and that having the same number of years of schooling available to everyone provides equal access to education. However, learning outcomes are not beyond the influence of institutional intervention. Equality of opportunity is measured by accomplishment, or the extent to which students achieve defined educational objectives. Student success is considered the most significant measure of institutional quality and effectiveness. It is therefore not surprising that "defining and contributing to institutional effectiveness, particularly in regard to outcomes for students" is a priority for student affairs professionals in the 1990's (Strange, 1991).

The results of the current research support its original hypothesis which predicted improved student achievement and persistence for those who participated in an early contact program. These findings have major implications for student affairs professionals, especially in institutions with missions and populations similar to those of Thomas Nelson Community College.

The early contact program, as applied in the current research, highlights a combination of principles which may guide the actions of successful student retention programs.

Current findings reinforce the literature where it recommends that student retention programs are most effective when they are front-loaded, targeted, proactive, personal, and systematic in nature. A brief discussion of each of these program principles follows.

A program is front-loaded when it concentrates the majority of its resources and energies on the early stages of the student's college experience. Since over half of college attrition occurs in the first semester, and since most students who leave an institution during the first year make the decision to do so early in their first semester, the freshman year offers the greatest opportunity for controlling attrition. This principle has special significance for community colleges given the fact that they enroll 54 percent of all entrants to higher education (Rice, 1989), and given that a sizeable proportion of these students enter without the basic skills to master college-level work. Unlike continuing students, newcomers to higher education are unfamiliar with the college's social and academic environment. Effective student retention programs address the special needs newcomers have for information, involvement, and a sense of belonging.

Another key program principle is that of accurately targeting support services toward the students that need it. Because the needs of individual learners are so different, one-size-fits-all services are likely to be ineffective.

The current research focused interventions on first-time underprepared students because this category of students had previously been found to be at risk of not accomplishing their educational objectives. Institutional research can identify and track other high-risk subpopulations in need of targeted, preemptive interventions. Faced with the dual realities of demographic changes and scarce resources, student retention programs can be more efficient if they substitute targeted efforts for the traditional scatter gun approach to service delivery. The goal is to develop a constructive match between student needs and supportive institutional actions.

By the same token, no campus can afford to employ passive approaches to serving students. Effective institutions do not leave student success to chance, but instead, take proactive roles. In reality, students, especially new high-risk students, are generally unaware of campus resources available to facilitate their success. These campus resources remain largely untapped when it is assumed that students will take the initiative to identify their own needs, learn about available services, and access them. Effective retention outreach activities serve to "prime the pump" for interaction and support services to targeted student groups.

Personal contact with students is the most effective form of retention outreach. The current research used both

in-person and telephone contacts to foster interaction between first-time students and faculty, staff, and other students in an effort to personalize the college environment. Assuming that students need to feel as if they matter in order to achieve and persist in college, personal contact is the preferred method of conveying a caring attitude. This principle is especially important for large community colleges where size puts them in danger of becoming impersonal, and where students spend less time on campus and have less interaction with faculty, staff, and other students than their counterparts on residential campuses. Some college personnel may see efforts designed to convey a personal interest in students as coddling or hand-holding. These concepts typically become more justifiable, however, when these same personnel have their own college-age children in mind (Levitz, 1992).

Finally, student retention programs are most effective when they are systematic in nature. Programs are systematic when they relate to the mission of the college, and are based on a plan for the continuous improvement of student outcomes. The systematic program has a statement of purpose and assumptions, measurable goals and objectives, as well as a method of evaluation and feedback. While the organization and implementation of a successful retention program varies by institution, the need to track and demonstrate results is universal. Otherwise, it is difficult to separate effective

from ineffective interventions, or to respond to the changing needs of the students and the institution. Funding is another important consideration. Programs which fail to show results are unlikely to attract campus resources.

For example, to broaden the early contact program of the current research to the total population of first-time underprepared students at the subject institution (N = 560), full-time coordination and a five-fold increase of the effort by faculty and staff would likely be required. The intervention could best be sustained in a centralized advisement center where faculty and staff could contact targeted students by phone to encourage them to use the resources the college has to offer, and to initiate academic advising. Tutorial services might also be increased to better serve the needs of students in high-risk courses.

Student satisfaction surveys would be administered on a continual basis. While the current research failed to show a significant difference in comparison group satisfaction, adjustment of the timing of the survey, along with analysis of more service-specific questions would likely yield more useful results. The institution would use survey results to strengthen and enhance educational programs and services. In this way, the college would have systematic assurance of continuous improvement with regards to its programs and services.

Explanation of Results

Results of the experiment to examine the effectiveness of an early contact program on the success of new underprepared community college students indicated significantly greater academic achievement and persistence for program participants than for control group members who were left to seek their own support from the institution. There are several possible reasons for these outcomes. One explanation is that the experimental subjects responded positively to supportive interventions on their behalf. As theorists suggest, increased social and academic interaction, early contact and information, and a feeling that they mattered to someone at the college resulted in improved grades and persistence among program participants.

Another reason for research results might be the phenomenon referred to by psychologists as the Hawthorne Effect. The special attention received by experimental subjects, not the experimental treatment itself, may have caused their improved performance. Since the study lacked an attention placebo treatment for the control group, the Hawthorne Effect is a viable explanation for research outcomes. If it is true that the attention given the subjects during the experiment was the major factor leading to performance gains, future researchers and practitioners have a good deal of latitude with the design and delivery of their early contact programs.

The matter of external influences on sample members is another factor which may have had a bearing on research outcomes. While there is evidence which suggests that comparison groups in this study were essentially equivalent with respect to race, gender, average age, and knowledge of the basic skills upon entry to the college, the groups may, by chance, have had important differences on external characteristics. For example, control group members may have had less family support for their educational objectives, more hours of weekly employment, more day care problems, or they may have lived a greater distance from the college. Chance differences on these or other external influences could have impacted performance on the dependent variables. Perhaps this was especially true with regard to the older, black females cited previously as displaying the highest attrition in both groups.

According to Olivas (1979), the ratio for withdrawal for nonacademic reasons (such as employment) as opposed to academic reasons among community college students is four to one. By comparison, the ratio of nonacademic to academic reasons for which four-year residential students leave college is two to one (Olivas, 1979).

Analyses conducted on one of the dependent variables of achievement did not indicate significant differences in performance between comparison groups. That variable was the average number of productive grades earned by the two

groups when controlling for attrition. Yet, the experimental group significantly out-performed the control group on every other measure of achievement, even when controlling for attrition. One likely explanation is that persisters in the control group withdrew from more college (as opposed to developmental) courses than did persisters in the experimental group. Assuming that is true, a larger proportion of the control group persisters' productive grades would have been earned in developmental courses which award no quality points. This could explain why persisters in the two groups had a similar number of productive grades, while at the same time, experimental group persisters had a significantly higher average GPA and attained more college credits. It follows that if experimental subjects were more likely to persist in college, they were also more likely than control group members to persist in the more challenging college-level courses.

Another interesting finding was the higher average age of nonpersisters from the experimental group as compared to nonpersisters from the control group (26.3 versus 21.5 years for between-semester attrition). Older subjects in the experimental group failed to return for the second semester in spite of their participation in the early contact program. One explanation is that adults have more diverse needs than their traditional college-age counterparts, and are more likely to have competing external priorities which

are beyond the influence of the institution, such as family and employment responsibilities (Schlossberg et al., 1989).

The current research failed to yield significant differences in level of satisfaction between comparison groups as measured by a 72 percent response rate on the ACT Student Opinion Survey. One explanation is that the test groups were equally satisfied with the college after the eleventh week of their first semester. Another explanation is that only those from both groups who were reasonably satisfied with the college responded to the survey.

It is possible that 11 weeks was not long enough for the subjects to have formed an opinion about the college. Perhaps after final examinations and receipt of first-semester grades, a later administration of the opinion survey would have reflected more variability between comparison groups on average satisfaction levels.

Ambiguous phrasing of the two opinion survey items provides another possible explanation for analysis outcomes. Subjects were asked to rate their satisfaction with the college in general, and with the college's concern for them as individuals. The written comments by respondents in the "comments and suggestions" section of the survey lend support to this rationale. Twenty-five subjects (17 percent of respondents) provided written comments on their opinion surveys. Comments were very diverse, indicating a broad range of perceptions concerning their college experiences.

Eighteen respondents voiced complaints regarding such matters as parking availability, campus security and lighting, the registration process, program offerings, faculty attitudes, physical facilities, food services, and the lack of adequate publicity for student activities. Seven respondents provided positive comments.

The point is, that had the survey items under investigation been more specific, there might have been less of a "halo effect." The responses may have more closely reflected subject satisfaction with the experimental treatment versus the usual treatment for new students.

Another reason for the sample members' similar and relatively high satisfaction ratings may be found in the nature of self-report inventories. A common weakness of attitude scales is the questionable honesty, frankness, and awareness of respondents (Gay, 1992). The investigator cannot be sure that the individual is expressing his or her true attitude rather than a "socially acceptable" attitude. If subjects provided answers they perceived as being desirable rather than truthful, then resulting data would not generate an accurate base for assessing student satisfaction. In the current research, subjects' social security numbers were "bubbled in" by the investigator prior to the mail administration in order to facilitate survey tracking. Therefore, subjects knew that their responses were not anonymous, a situation which may have led to

inflated satisfaction ratings. Furthermore, since 28 percent of the sample did not respond to the survey, generalizations regarding comparison group satisfaction levels based on these results are made with caution.

Limitations and Research Suggestions

The current study seeks to generalize findings to the population from which the sample was drawn. The specific nature of the setting and the treatment may limit ability to generalize beyond the experimentally accessible population to the larger population of all first-time underprepared community college students. Explicit descriptions of the sample, experimental treatment, and setting were provided so that other researchers could reproduce the study.

In addition to the design and treatment limitations discussed previously, the following additional limitations of the study are noted. All studies which seek to measure student persistence are limited in that it is essentially impossible to distinguish permanent student withdrawal from institutional transfer or stop-out behavior. This is especially true at community colleges where students are more likely to practice intermittent attendance (Cohen & Brawer, 1988).

Since the students most likely to return to the community college are those who left for noncollege reasons (Olivas, 1979), a study of the characteristics of students

who leave with passing grades versus those who withdraw for academic reasons is suggested. Research on why students withdraw should be studied on an institutional level since institutional characteristics have large effects on persistence (Cope & Hannah, 1975).

Further research on precisely when community college students tend to withdraw is also needed. Closer examination of withdrawal patterns at the three critical stages for first-semester students, as identified in this study, is suggested. Information of this type could improve institutional practice through more accurate timing of supportive interventions.

In the current study, the length of the treatment extended over a period of 11 weeks. Measurement of the dependent variables of achievement, persistence, and satisfaction occurred at or near the end of one semester. In the absence of future multi-institutional information that would track sample members for a one-, two-, or even four-year period, it is impossible to draw conclusions about the long-term effects of the independent variable on student success. A longitudinal study of comparison group members would be useful. Since sample selection was purposely restricted to subjects who entered the institution with the stated intention of completing a degree, a two-year follow-up study is suggested for future research of this kind.

Not all members of the current study benefitted equally from the same contact approaches. The early contact program under investigation consisted of three distinct college-initiated elements--telephone counseling, intensive advising, and peer tutoring. Was one of these contact approaches clearly the most effective, or was it a combination of the three strategies that made the difference?

Data collection and analysis procedures did not provide an answer to this question. However, it is likely that individual student differences moderated the effects of the early contact program in this study. In summary, a more comprehensive mapping of the interactions between student traits and first-semester transitions may allow for a more precise and effective application of different advocacy approaches toward the eventual goal of improved community college student success.

Appendix A

College Impact Models

Source: Reprinted from Pascarella & Terenzini, 1991

Appendix B

Thomas Nelson Community College Mission Statement

Thomas Nelson Community College provides residents of the Virginia Peninsula with access to comprehensive instructional programs which extend through the associate degree level. Courses of study provide individuals with the knowledge and skills required for employment, to continue their education at four-year colleges and universities, and to become generally educated citizens able to function in a complex world.

As a community-based institution, Thomas Nelson Community College strives to be responsive to the educational and skills needs of area businesses, industries, and government agencies. As an institution of higher education, the college is committed to high academic standards in all its curricular offerings and to excellence in all its support programs and services. For all degree programs a required core of general education courses is designed to promote intellectual and cultural awareness. Admission to the college is open to all those who can benefit academically from its programs. For those who lack the necessary educational background, the college offers

developmental courses in reading, English, and mathematics that provide the skills required for entry into its occupational-technical and transfer programs. The college also offers an honors program to challenge high-achieving students to academic levels which exceed normal class requirements.

To assure that students have the opportunity for success, a comprehensive program of student development services is provided. To assist students in making well-considered academic, career, and personal decisions, the college offers a range of testing and counseling services. Through the non-credit offerings of its community education program, the college meets individuals' short-term career goals and provides opportunities for personal enrichment (Thomas Nelson Community College Catalog and Student Handbook 1992-93, p 5).

Appendix C

Experimental Group Correspondence

September 10, 1992

Sample Student
100 Study Drive
Hampton, Virginia 23666

Dear Sample:

As your TNCC campus contact, I am writing to inform you of an important service at the college--*free tutoring*. The Tutorial Learning Center (TLC) is located in the college library, next to the Learning Lab. The TLC is available by appointment, or you can walk in for help on a specific question. A receptionist is there Monday through Thursday from 8 a.m. to 5 p.m., and Friday from 8 a.m. to 2 p.m.

The tutors, like yourself, are students working toward a degree at Thomas Nelson Community College. Their services include helping you prepare for an exam, tackle a class assignment, or learn a new concept. They can also help you with time management and study skills. To find out more about this free service, call Becky Williams at 825-2804 or stop by her desk in the TLC.

Sincerely,

Jane Doe
Campus Contact

P.S. Present this letter at the TLC and you will receive a free study skills guide!

November 9, 1992

Sample Student
100 Study Drive
Hampton, Virginia 23666

Dear Sample:

We need your opinion on something--the quality of services at Thomas Nelson Community College. Enclosed is an opinion survey and a pencil to use when completing the survey.

For the study to be worthwhile, we need everyone's participation. So please take 10 minutes now and complete the enclosed form. To thank you for your cooperation, if you return the survey in the enclosed prepaid envelope by **November 23**, your name will be entered into a drawing to win a $25 gift certificate for use at the TNCC Bookstore. (Chances of winning are approximately 1 in 150.)

As a valued member of the college, your opinions are important. Your responses will help us improve services for you and for other TNCC students. Be assured that the information you provide will be kept confidential.

Please complete and return the enclosed survey, along with your drawing entry form below, as soon as possible. Good luck on the drawing, and thank you for letting us know how you feel.

Best wishes,

Judy McMillan
Director of Admissions and Records

$25 TNCC BOOKSTORE GIFT CERTIFICATE DRAWING ENTRY

NAME:	Sample Student
ADDRESS:	100 Study Drive
	Hampton, Virginia 23666
PHONE:	826-0000

Return with completed opinion survey in the enclosed envelope by 11/23/92 so the drawing can be held on 11/24/92. Winner will be notified by telephone on Wednesday, 11/25.

THOMAS NELSON COMMUNITY COLLEGE

Dear

As your faculty advisor, I would like to meet with you soon to discuss your program of study and your plans for the upcoming semester. In preparation for our meeting, consult the spring course schedule and be thinking about the courses and times you prefer for spring.

Please call me at _____ to arrange an advising appointment. I look forward to hearing from you soon.

Cordially,

THOMAS NELSON COMMUNITY COLLEGE
November 24, 1992

Dear

We recently mailed you a survey asking for your opinions about TNCC. The student opinion survey is part of an important study being conducted to improve services for you and other TNCC students. I know your time is valuable and this is a busy time of year, but we are still hoping to hear from you soon.

The Bookstore Gift Certificate drawing has been postponed for you to December 8. (Please mail your completed survey and drawing entry form now.) If you didn't receive the survey or would like another one, call me at 825-2910.

While many students have already returned their surveys, our study will not be complete until we hear from you. If you have already returned your survey, please disregard this reminder, and thank you for your cooperation.

Sincerely,

References

Abrams, H., & Jernigan, L. (1984). Academic support services and the success of high-risk students. American Educational Research Journal, 21, 261-274.

Adelman, C. (1992). The way we are: The community college as American thermometer. Report released by the U.S. Department of Education, Washington D. C.

Aitken, N. D. (1982). College student performance, satisfaction, and retention: Specification and estimation of a structural model. Journal of Higher Education, 53(1), pp. 32-50.

Alfred, R. L., & Kreider, P. (1991). Creating a culture for institutional effectiveness. Community, Technical, and Junior College Journal. April/May, Vol. 61, No. 5.

Alfred, R. L., & Linder, V. P. (1990). Rhetoric to reality: Effectiveness in community colleges. Ann Arbor: Community College Consortium and Center for the Study of Higher and Postsecondary Education.

American College Testing Program Institutional Data File. (1992). National dropout rates. Iowa City, IA

Astin, A. W. (1975). Preventing students from dropping out. San Francisco: Jossey-Bass.

Astin, A. W. (1985a). Achieving educational excellence: A critical assessment of priorities and practices in higher education. San Francisco: Jossey-Bass.

Astin, A. W. (1985b). Involvement: The cornerstone of excellence. Change. July/August.

Axtell, J. (1971). The death of the liberal arts college. History of Education Quarterly. Winter, p. 348.

Baird, Leonard L. (1990). The undergraduate experience: Commonalities and differences among colleges. Research in Higher Education, 31(3), pp. 271-278.

Beal, P. E., & Noel, L. (1980). What works in student retention. Iowa City: American College Testing Program, National Center for Higher Education Management Systems. (ERIC Document Reproduction Service No. ED 197 635).

Bean, J. P. (1983). The application of a model of turnover in work organizations to the student attrition process. Review of Higher Education, Vol. 6, pp. 129-148.

Bean, J. P., & Metzner, B. S. (1985). A conceptual model of nontraditional undergraduate student attrition. Review of Educational Research. Vol. 55, No. 4, pp. 485-540.

Borg, W. R., & Gall, M. D. (1989). Educational research: An introduction (5th ed.). New York: Longman.

Boyer, E. L. (1987). College: The undergraduate experience in America. Report of the Carnegie Foundation for the Advancement of Teaching. New York: Harper & Row.

Boyer, E. L. (1990). Campus life: In search of community. Report of the Carnegie Foundation for the Advancement of Teaching. New York: Harper & Row.

Bridgeman, B. (1981). Gain analysis in placement test validation: An example of using the Descriptive Tests of Mathematics Skills. Research in Higher Education 15: 175-186.

Brint, S., & Karabel, J. (1989). The diverted dream: Community colleges and the promise of educational opportunity in America, 1900-1985. New York: Oxford University Press.

Bruning, R. (1985). DRP Review. In J. V. Mitchell (Ed.), The Ninth Mental Measurements Yearbook. Buros Institute of Mental Measurements.

Carnegie Foundation for the Advancement of Teaching. (1986). Carnegie survey of undergraduates. Chronicle of Higher Education. February 5, pp. 27-30.

Carter, E. (1991). Research reports. Community, Technical, and Junior College Journal. Vol. 62, No.1, p. 50. August/September.

Christie, N. G., & Dinham, S. M. (1991). Institutional and external influences on social integration in the freshman year. Journal of Higher Education. Vol. 62, No. 4, pp. 413-435.

Chronicle of Higher Education Almanac. (1992). The nation. September.

Cohen A. M., & Brawer, F. (1988). The American community college. San Francisco: Jossey-Bass.

Cope, R., & Hannah, W. (1975). Revolving college doors: The causes and consequences of dropping out, stopping out, and transferring. New York: John Wiley & Sons.

Commission on the Future of Community Colleges. (1988). Building communities: A vision for a new century. Washington D. C.: American Association of Community and Junior Colleges.

Commission on the Skills of the American Workforce. (1990). America's choice: High skills or low wages! Rochester National Center on Education and the Economy.

Commission on the University of the 21st Century. (1990). The case for change. Richmond, VA.

Council for the Advancement and Support of Education. (1991). Improving student success. Washington D. C.: On target: A newsletter for CASE two-year institutions. October.

Crook, D., & Lavin, D. (1989). The community-college effect revisited: The long-term impact of community-college entry on B.A. attainment. Paper presented at the meeting of the American Educational Research Association, San Francisco, CA.

Cross, K. P. (1971). Beyond the open door. San Francisco: Jossey-Bass.

DeLoughry, T. J. (1990). Washington update. Chronicle of Higher Education. December 12, p. A18.

Dougherty, K. (1987). The effects of community colleges: Aid or hinderance to socioeconomic attainment? Sociology of Education, 60, pp. 86-103.

Dunphy, L., Miller, T., Woodruff, T., & Nelson, J. (1987). Exemplary retention strategies for the freshman year. In M. Stodt & W. Klepper (Eds.), Increasing retention: Academic and student affairs administrators in partnership. New Directions in Higher Education No. 60. San Francisco: Jossey-Bass.

Earl, W. R. (1987). The impact of an intrusive orientation model on the retention and grade point average of second semester freshmen on academic probation at an urban university. Ph.D. Dissertation, Old Dominion University. Dissertation Abstracts No. 48, p. 1398.

Eaton, J. S. (1989). Minority access, participation, success: One community college president's thoughts. Educational Record. pp. 56-58.

Endo, J., & Harpel, R. (1982). The effect of student-faculty interaction on students' educational outcomes. Research in Higher Education, 16, pp. 115-138.

Evangelauf, J. (1990). A migrant from historical research to higher-education reform. Chronicle of Higher Education, p. A3.

Ferguson, M. (1990). The role of faculty in increasing student retention. College and University. Vol. 65, No. 2, pp. 127-35, Winter.

Fleming, J. (1981). Special needs of blacks and other minorities. In A. Chickering & associates (Eds.) The modern American college. San Francisco: Jossey-Bass.

Foley, G. (1984). CGP Written English Expression Placement Test Review. In J. V. Mitchell (Ed.) The Eighth Mental Measurements Yearbook. Buros Institute of Mental Measurements.

Forrest, A. (1982). Increasing student competence and persistence: The best case for general education. Iowa City: American College Testing Program, National Center for Advancement of Educational Practices.

Friendly, J. (1985, November). Preventing dropouts: Will the personal touch prevent college dropouts? New York Times, Education Section, p. 1.

Fund for the Improvement of Postsecondary Education. (1992). Application for grants under the comprehensive program. Washington D. C.: Department of Education.

Gay, L. R. (1992). Educational research: Competencies for analysis and application. New York: Macmillan Publishing Company.

Glennen, R. E., & Baxley, D. M. (1985). Reduction of attrition through intrusive advising. NASPA Journal, 22, 3, pp. 10-14.

Gilley, W. (1991). Thinking about higher education: The 1990's and beyond. New York: Macmillan Publishing Company.

Governor's Advisory Committee Workforce Virginia 2000. (1991). The Virginia plan for strengthening the Commonwealth's 21st century workforce: Partnerships for excellence.

Guide to the use of the Descriptive Tests of Mathematical Skills. (1989) College Entrance Examination Board.

Graham, J. (1992). Watch us move: Preparing for the 21st Century. Richmond: Virginia Community College System.

Hanna, G. S. (1985). Review of Degrees of Reading Power. In Ninth mental measurements yearbook. (Lincoln, NE: Buros Mental Measurement Institute. pp. 444-447.

Harris, J. (1991). VCCS FTES enrollment comparison. Memorandum to VCCS Presidents. Richmond: Virginia Community College System, September 16.

Harris, R. (1984). CGP Written English Expression Placement Test Review. In J. V. Mitchell (Ed.), The Eighth Mental Measurements Yearbook. Buros Institute of Mental Measurements.

Hodgkinson, H. J. (1989). Videotape of teleconference, Moving toward the 21st century: Data for decisions. Charlottesville, VA

Hossler, D. (1984). Enrollment management: An integrated approach. New York: College Entrance Examination Board.

Jacobson, R. L. (1991). Academic leaders predict major changes for higher education in recession's wake: A big challenge: Tradeoffs between student access and academic quality. Chronicle of Higher Education. Vol. 38, No. 13, p. A1.

Jacoby, B. (1989). The student commuter: Developing a comprehensive institutional response. ASHE-ERIC Higher Education Reports, No. 7. Washington D. C.: Association for the Study of Higher Education.

Johnston, W. B., & Packer, A. H. (1987). Workforce 2000: Work and workers for the 21st century. Indianapolis, IN: Hudson Institute.

Jones, E. (1992). A model for deriving the transfer rate. Washington D. C.: American Association of Junior and Community Colleges.

Jones, D. J., & Watson, B. C. (1990). High risk students in higher education: Future trends. ASHE-ERIC Higher Education Report, No. 3. Washington D. C.: Association for the Study of Higher Education.

Kirschenbaum, D., & Perri, M. (1982). Improving academic competence in adults: A review of recent research. Journal of Counseling Psychology, 29, pp. 76-94.

Kuh, G. D., Schuh, J. H., Whitt, E. J., & Associates. (1991). Involving colleges: Successful approaches to fostering student learning and development outside the classroom. San Francisco: Jossey-Bass.

Kulik, C. C., Kulik, J. A., & Shwalb, B. J. (1983). College programs for high-risk and disadvantaged students: A meta-analysis of findings. Review of Educational Research. Vol. 53, No. 3, pp. 397-414.

Levitz, R. (1992, July). Winning strategies for challenging times. Paper presented at the National Conference on Student Retention, San Francisco, CA.

Levitz, R., & Noel, L. (1989). Connecting students to institutions: Keys to retention and success. In L. Upcraft, J. Gardner, & associates (Eds.) The freshman year experience: Helping students survive and succeed in college. San Francisco: Jossey-Bass.

Magallan, R. (1988). Programs that work. Change. Vol. 20, No. 3, pp. 63-65, May/June.

Mayhew, L. B., Ford, P. J., & Hubbard, D. L. (1990). The quest for quality: The challenge for undergraduate education in the 1990's. San Francisco: Jossey-Bass.

Monroe, C. R. (1972). Profile of the community college. San Francisco: Jossey-Bass.

National Institute of Education. (1984). Involvement in learning: Realizing the potential of American higher education. Study Group on the Conditions of Excellence in American Education. Washington, D. C.: U.S. Department of Education.

Neumann, W. (1985). Persistence in the community college: The student perspective. Ph.D. Dissertation, Syracuse University. Dissertation Abstracts International.

Noel, L., Levitz, R., & Kaufmann, J. (1982). Campus services for academically underprepared students. In L. Noel & R. Levitz (Eds.) How to succeed with academically underprepared students. Iowa City: American College Testing Program, National Center for Advancement of Educational Practices.

Noel, L., Levitz, R., Saluri, D., & associates. (1985). Increasing student retention: Effective programs and practices for reducing the dropout rate. San Francisco: Jossey-Bass.

Olivas, M. (1979). The dilemma of access: Minorities in two-year colleges. Washington D. C.: Howard University Press.

Pace, C. R. (1989). The undergraduates: A report of their activities and progress in college in the 1980's. Los Angeles: Center for the Study of Evaluation, University of California.

Parnell, D. (1990). Dateline 2000: The new higher education agenda. Washington D.C.: Community College Press.

Pascarella, E. T. (1980). Student-faculty informal contact and college outcomes. Review of Educational Research. Vol. 50, pp. 545-595.

Pascarella, E. T. (1985). College environmental influences on learning and cognitive development: A critical review and synthesis. In J. Smart (Ed.) Higher education: Handbook of theory and research. Vol. 1. New York: Agathon.

Pascarella, E., Duby, P., & Iverson, B. (1983). A test and reconceptualization of a theoretical model of college withdrawal in a commuter institution setting. Sociology of Education, 56, pp. 88-100.

Pascarella, E. T., Smart, J. C., & Ethington, C. A. (1986). Long-term persistence of two-year college students. Research in Higher Education. Vol. 24, No.1, pp. 47-71.

Pascarella, E., & Terenzini, P. (1980). Predicting freshman persistence and voluntary dropout decisions from a theoretical model. Journal of Higher Education, 51, 60-75.

Pascarella, E. T., & Terenzini, P. T. (1991). How college affects students: Findings and insights from twenty years of research. San Francisco: Jossey-Bass.

Puyear, D. (1989). Semesters, enrollment, and retention: The effect of converting from quarters to semesters on enrollment and retention in the Virginia Community College System. Richmond, VA: Virginia Community College System.

Pusey, N. M. (1978). American higher education 1945-1970: A personal report. Cambridge: Harvard University Press.

Richardson, R. C., Jr. (1988). The presence of access and the pursuit of achievement. In J. S. Eaton (Ed.) Colleges of choice: The enabling impact of the community college. New York: Collier Macmillan.

Richardson, R. C., Jr., & Bender, L. W. (1987). Fostering minority access and achievement in higher education. San Francisco: Jossey-Bass.

Rice, R. L. (1989). Commuter Students. In M. L.Upcraft & J. N. Gardner (Eds.) The freshman year experience: Helping students survive and succeed in college. San Francisco: Jossey-Bass.

Rosenberg, M., & McCullough, B. C. (1981). Mattering: Inferred significance and mental health among adolescents. In R. Simmons (Ed.) Research in community and mental health. Vol. 2. Greenwich, CT: JAI Press.

Roueche, J. E., & Baker, G. A. (1987). Access and excellence: The open-door college. Washington D.C.: The Community College Press.

Roueche, J. E., & Roueche, S. D. (1982). Literacy development: Foundation for general education. In B. L. Johnson (Ed.) General education in two-year colleges. New Directions for Community Colleges, No. 40. San Francisco: Jossey-Bass.

Rudolph, F. (1965). The American college and university: A history. New York: Knopf.

Samuels, F. (1985). Closing the door: The future of minorities in two-year institutions. Paper presented at the National Adult Education Conference of the American Association for Adult and Continuing Education. (ERIC Document Reproduction Service No. ED 263 946).

Schlossberg, N. K. (1989). Marginality and mattering: Key issues in building community. In M. J. Barr & M. L. Upcraft (Eds.) Designing campus activities to foster a sense of community. New Directions for Student Services, No. 48.

Schlossberg, N. K., Lynch, A. Q., & Chickering, A. W. (1989). Improving higher education environments for adults: Responsive programs and services from entry to departure. San Francisco: Jossey-Bass.

Scott, D. C. (1987). Community college programs for underprepared students. (ERIC Document Reproduction Service No. ED 263 946).

Seybert, J. (1990). Assessing institutional effectiveness in community colleges: What to measure and how to start. Institutional Effectiveness in Focus. 1(1), pp. 1, 5.

Simpson, J. L. (1988). Academic success as a function of participation in special supportive programs. Ed.D. Dissertation, Rutgers University. Dissertation Abstracts, No. 50, p. 637.

Smith, D. G. (1989). The challenge of diversity: Involvement or alienation in the academy? ASHE-ERIC Higher Education Reports, 5.

Spanard, J. A. (1990). Beyond intent: Reentering college to complete the degree. Review of Educational Research. Vol. 60, No. 3, pp. 309-344.

Stage, F. (1989). An alternative to path analysis: A demonstration of LISREL using students' commitment to an institution. Journal of College Student Development, 30 129-135.

Stodt, M. M. & Klepper, W. M. (1987). Increasing retention: Academic and student affairs administrators in partnership. New Directions for Higher Education, No. 60.

Strange, C. C. (1991). Managing college environments: Theory and practice. In T.K. Miller, R. B. Winston, Jr. & Associates, Administration and leadership in student affairs: Actualizing student development in higher education. Muncie, IN: Accelerated Development.

Strategic Planning Task Force. (1990). A strategic plan for the 1990's: Meeting the challenges of a new decade. Hampton, VA: Thomas Nelson Community College.

Terenzini, P., Lorang, W., & Pascarella, E. (1981). Predicting freshmen persistence and voluntary dropout decisions: A replication. Research in Higher Education. 15, 109-127.

Thomas Nelson Community College Catalog and Student Handbook. (1992-93) Hampton, Virginia: Thomas Nelson Community College.

Tinto, V. (1975). Dropout from higher education: A theoretical synthesis of recent research. Review of Educational Research, 45, 89-125.

Tinto, V. (1987). Leaving college: Rethinking the causes and cures of student attrition. Chicago: University of Chicago Press.

Tinto, V. (1988). Stages of student departure: Reflections on the longitudinal character of student leaving. Journal of Higher Education. 59: 438-455.

Upcraft, M. L., Gardner, J. N., & associates. (1989). The freshman year experience: Helping students survive and succeed in college. San Francisco: Jossey-Bass.

Urban Community Colleges Commission. (1988). Minorities in urban community colleges: Tomorrow's students today. Washington D.C.: American Association of Community and Junior Colleges.

User's Guide. (1992). The ACT Evaluation/Survey Service for Educational Institutions and Agencies. 5th ed. Iowa City, IA: American College Testing.

Vaughan, G. B. (1983). Issues for community college leaders in a new era. San Francisco: Jossey-Bass.

Voorhees, R. A. (1987). Toward building models of community college persistence: A logit analysis. Research in Higher Education. 26, pp. 115-129.

Walsh, R. (1985). Changes in college freshmen after participation in a student development program. Journal of College Student Personnel, 26, 310-314.

Watkins, B. T. (1991). Using computers to teach basic skills: Miami-Dade Community College seeks to augment its many remedial courses. Chronicle of Higher Education. Vol. 38, No. 6, October 2, p. A23.

Weidman, J. (1989). Undergraduate socialization: A conceptual approach. In J. Smart (Ed.) Higher education: Handbook of theory and research. Vol. 5. New York: Agathon.

Weis, L. (1985). Between two worlds: Black students in an urban community college. Boston: Routeledge & Kegan Paul.

Zwerling, L. S. (1976). Second best. New York: McGraw Hill.

Zwerling, L. S. (1980). "Reducing attrition at two-year colleges." Community College Review. Fall, pp. 55-58.

Vita

Judy Bierlein McMillan

Birthdate: August 3, 1947

Birthplace: Saginaw, Michigan

Education:

1980-1983	The George Washington University Washington D. C. Education Specialist
1974-1976	Old Dominion University Norfolk, Virginia Master of Science in Education
1965-1969	Michigan State University East Lansing, Michigan Bachelor of Arts